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Contract No. 68-W-98-210

# RAC II

FINAL BASELINE HUMAN HEALTH  
RISK ASSESSMENT  
HORSESHOE ROAD COMPLEX SITE  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY  
SAYREVILLE, NEW JERSEY  
Volume I  
Work Assignment No.: 013-RICO-02BT

***Remedial Response, Enforcement Oversight  
and Non-time Critical Removal Activities  
at Sites of Release or Threatened Release  
of Hazardous Substances in EPA Region II***

**CDM** Federal Programs Corporation  
A Subsidiary of Camp Dresser & McKee Inc.

in association with **TAMS**

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400116





## TABLE OF CONTENTS

### BASELINE HUMAN HEALTH RISK ASSESSMENT

	<u>PAGE</u>
1.0 INTRODUCTION .....	1
1.1 Scope of Risk Assessment .....	1
1.2 Site Description and History .....	5
2.0 DATA COLLECTION AND EVALUATION .....	6
2.1 Media to be Evaluated .....	6
2.1.1 Soil .....	6
2.1.2 Ground Water .....	7
2.1.3 Surface Water .....	8
2.1.4 Sediment .....	8
2.1.5 Building Materials .....	9
2.2 Treatment of Data .....	9
2.2.1 Data Quality .....	10
2.3 Criteria for Selection of Chemicals of Potential Concern .....	11
3.0 EXPOSURE ASSESSMENT .....	13
3.1 Identification of Exposure Pathways .....	14
3.1.1 Soil .....	14
3.1.2 Groundwater .....	15
3.1.3 Surface Water .....	15
3.1.4 Sediment .....	16
3.1.5 Building Materials .....	16
3.2 Exposure Point Concentrations .....	16
3.3 Calculation of Daily Intakes .....	17
4.0 TOXICITY ASSESSMENT .....	18
4.1 Noncarcinogenic Effects .....	18
4.1.1 Definition and Derivation of Reference Doses .....	18
4.1.2 RfDs for Detected Chemical Contaminants .....	19
4.2 Carcinogenic Effects .....	19
4.2.1 Definition and Derivation of Slope Factors .....	19
4.2.2 Slope Factors for Detected Chemical Contaminants .....	20

## TABLE OF CONTENTS (cont'd.)

	<u>PAGE</u>
5.0 RISK CHARACTERIZATION .....	21
5.1 Quantitative Results of Carcinogenic Risk and Noncarcinogenic Effects	
Evaluation .....	22
5.1.1 Area Residents (Trespassers) .....	22
5.1.2 Residents .....	23
5.1.3 Site Workers .....	23
5.1.4 Construction Workers .....	24
5.2 COPCs and Media/Exposure Points that Trigger the Need for Cleanup .....	25
5.2.1 Area Residents (Trespassers) .....	25
5.2.2 Residents .....	26
5.2.3 Site Workers .....	26
5.2.4 Construction Workers .....	27
6.0 UNCERTAINTIES IN RISK ASSESSMENT .....	28
6.1 Central Tendency Calculations .....	29
6.1.1 Residents .....	30
6.1.2 Site Workers .....	30
6.1.3 Construction Workers .....	30
7.0 PRELIMINARY REMEDIATION GOALS .....	31
7.1 Definition of Preliminary Remediation Goals .....	31
8.0 SUMMARY OF BASELINE RISK ASSESSMENT .....	32
9.0 REFERENCES .....	34

## STANDARD TABLES

Table 1	Selection of Exposure Pathways
Table 2.1	Occurrence, Distribution and Selection of Chemicals of Potential Concern
Table 3.1	Medium-Specific Exposure Point Concentration Summary - Surface Soil
Table 3.2	Medium-Specific Exposure Point Concentration Summary - Subsurface Soil
Table 3.3	Medium-Specific Exposure Point Concentration Summary - Surface Water
Table 3.4	Medium-Specific Exposure Point Concentration Summary - Sediment
Table 3.5	Medium-Specific Exposure Point Concentration Summary - Building Materials
Table 4.1	Values Used for Daily Intake Calculations - Current and Future - Surface Soil - Area Residents (Trespassers)
Table 4.2	Values Used for Daily Intake Calculations - Current and Future - Building Materials - Area Residents (Trespassers)

## TABLE OF CONTENTS (cont'd.)

Table 4.3	Values Used for Daily Intake Calculations - Current and Future - Surface Water - Area Residents (Trespassers)
Table 4.4	Values Used for Daily Intake Calculations - Current and Future - Shellfish - Residents (Adult)
Table 4.5	Values Used for Daily Intake Calculations - Current and Future - Sediment - Area Residents (Trespassers)
Table 4.6	Values Used for Daily Intake Calculations - Future - Surface and Subsurface Soil - Site Workers
Table 4.7	Values Used for Daily Intake Calculations - Future - Surface and Subsurface Soil - Construction Workers
Table 4.8	Values Used for Daily Intake Calculations - Future - Building Materials - Site Workers
Table 4.9	Values Used for Daily Intake Calculations - Future - Building Materials - Construction Workers
Table 4.10	Values Used for Daily Intake Calculations - Future - Surface Water - Residents (Adult)
Table 4.11	Values Used for Daily Intake Calculations - Future - Surface Water - Residents (Child)
Table 4.12	Values Used for Daily Intake Calculations - Future - Sediment - Residents (Adult)
Table 4.13	Values Used for Daily Intake Calculations - Future - Sediment - Residents (Child)
Table 5.1	Non-cancer Chronic Toxicity Data - Oral
Table 5.2	Non-cancer Toxicity Data - Inhalation
Table 5.3	Non-cancer Toxicity Data - Special Case Chemicals
Table 6.1	Cancer Toxicity Data - Oral
Table 6.2	Cancer Toxicity Data - Inhalation
Table 6.3	Cancer Toxicity Data - Special Case Chemicals
Table 7.1	Calculation of Non-Cancer Hazards - RME - Current and Future - Surface Soil - Area Residents (Trespassers)
Table 7.2	Calculation of Non-Cancer Hazards - RME - Current and Future - Building Materials - Area Residents (Trespassers)
Table 7.3	Calculation of Non-Cancer Hazards - RME - Current and Future - Surface Water - Area Residents (Trespassers)
Table 7.4	Calculation of Non-Cancer Hazards - RME - Current and Future - Shellfish - Residents (Adult)
Table 7.5	Calculation of Non-Cancer Hazards - RME - Current and Future - Sediment - Area Residents (Trespassers)
Table 7.6	Calculation of Non-Cancer Hazards - RME - Future - Surface and Subsurface Soil - Site Workers
Table 7.7	Calculation of Non-Cancer Hazards - RME - Future - Surface and Subsurface Soil - Construction Workers

## TABLE OF CONTENTS (cont'd.)

Table 7.8	Calculation of Non-Cancer Hazards - RME - Future - Building Materials - Site Workers
Table 7.9	Calculation of Non-Cancer Hazards - RME - Future - Building Materials - Construction Workers
Table 7.10	Calculation of Non-Cancer Hazards - RME - Future - Surface Water - Residents (Adult)
Table 7.11	Calculation of Non-Cancer Hazards - RME - Future - Surface Water - Residents (Child)
Table 7.12	Calculation of Non-Cancer Hazards - RME - Future - Sediment - Residents (Adult)
Table 7.13	Calculation of Non-Cancer Hazards - RME - Future - Sediment - Residents (Child)
Table 8.1	Calculation of Cancer Risks - RME - Current and Future - Surface Soil - Area Residents (Trespassers)
Table 8.2	Calculation of Cancer Risks - RME - Current and Future - Building Materials - Area Residents (Trespassers)
Table 8.3	Calculation of Cancer Risks - RME - Current and Future - Surface Water - Area Residents (Trespassers)
Table 8.4	Calculation of Cancer Risks - RME - Current and Future - Shellfish - Residents (Adult)
Table 8.5	Calculation of Cancer Risks - RME - Current and Future - Sediment - Area Residents (Trespassers)
Table 8.6	Calculation of Cancer Risks - RME - Future - Surface and Subsurface Soil - Site Workers
Table 8.7	Calculation of Cancer Risks - RME - Future - Surface and Subsurface Soil - Construction Workers
Table 8.8	Calculation of Cancer Risks - RME - Future - Building Materials - Site Workers
Table 8.9	Calculation of Cancer Risks - RME - Future - Building Materials - Construction Workers
Table 8.10	Calculation of Cancer Risks - RME - Future - Surface Water - Residents (Adult)
Table 8.11	Calculation of Cancer Risks - RME - Future - Surface Water - Residents (Child)
Table 8.12	Calculation of Cancer Risks Non-Cancer Hazards - RME - Future - Sediment - Residents (Adult)
Table 8.13	Calculation of Cancer Risks Non-Cancer Hazards - RME - Future - Sediment - Residents (Child)
Table 9.1	Summary of Receptor Risks and Hazards for COPCs - Area Residents (Trespassers)

## **TABLE OF CONTENTS (cont'd.)**

Table 9.2a	Summary of Receptor Risks and Hazards for COPCs - Residents (Adult)
Table 9.2b	Summary of Receptor Risks and Hazards for COPCs - Residents (Child)
Table 9.3	Summary of Receptor Risks and Hazards for COPCs - Site Workers
Table 9.4	Summary of Receptor Risks and Hazards for COPCs - Construction Workers
Table 10.1	Risk Assessment Summary - Area Residents (Trespassers)
Table 10.2a	Risk Assessment Summary - Residents (Adult)
Table 10.2b	Risk Assessment Summary - Residents (Child)
Table 10.3	Risk Assessment Summary - Site Workers
Table 10.4	Risk Assessment Summary - Construction Workers

## **FIGURES**

Figure 1	Site Location Map
Figure 2	Site Map
Figure 3	Surface Soil, Soil Boring, NAPL Boring, Building Flooring, Test Pit and Monitoring Well Locations
Figure 4	Surface Water, Sediment, Building Dust and Material Sample Locations

## **APPENDICES**

Appendix A	Summary of Contaminants in Environmental Media
Appendix B	Concentration-Toxicity Screens
Appendix C	Chemical Contaminants of Concern
Appendix D	95 Percent UCL Calculations
Appendix E	Toxicity Profiles
Appendix F	Preliminary Remediation Goals (PRGs)

## ACRONYMS AND ABBREVIATIONS

ABS	-	Dermal Absorption Factor
ADC	-	Atlantic Development Corporation
AF	-	Soil-to-Skin Adherence Factor
AOC	-	Area of Concern
ARARs	-	Applicable or Relevant and Appropriate Requirements
ARC	-	Atlantic Resource Corporation
ARCS	-	Alternative Remedial Contracting Strategy
AT	-	Averaging Time
BOD	-	Biological Oxygen Demand
BW	-	Body Weight
CDI	-	Chronic Daily Intake
CDM Federal	-	CDM Federal Programs Corporation
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act
CF	-	Conversion Factor
COC	-	Chemical of Concern
COD	-	Chemical Oxygen Demand
CT	-	Central Tendency
DNAPL	-	Dense Nonaqueous Phase Liquid
DSM	-	Downstream Marsh
ED	-	Exposure Duration
EF	-	Exposure Frequency
EPA	-	United States Environmental Protection Agency
ERA	-	Ecological Risk Assessment
ET	-	Exposure Time
FI	-	Fraction Ingested
FS	-	Feasibility Study
HEAST	-	Health Effects Assessment Summary Tables
HHRA	-	Human Health Risk Assessment
HRDD	-	Horseshoe Road Drum Dump
IR	-	Ingestion Rate; Inhalation Rate
IRIS	-	Integrated Risk Information System
LNAPL	-	Light Nonaqueous Phase Liquid
LOAEL	-	Lowest-Observed-Adverse-Effect-Level
MCL	-	Maximum Contaminant Level
MCUA	-	Middlesex County Utilities Authority
NCEA	-	National Center for Environmental Assessment
NCP	-	National Oil and Hazardous Substance Pollution Contingency Plan (NCP)

NOAEL	-	No Observed Adverse Effect Level
NJDEP	-	New Jersey Department of Environmental Protection
NPL	-	National Priorities List
PAH	-	Polycyclic Aromatic Hydrocarbon
PAR	-	Pathway Analysis Report
PC	-	Permeability Constant
PCB	-	Polychlorinated Biphenyl
PRP	-	Potentially Responsible Party
PRG	-	Preliminary Remediation Goal
RA	-	Risk Assessment
RAGS	-	Risk Assessment Guidance for Superfund
RFC	-	Reference Concentration
RFD	-	Reference Dose
RI	-	Remedial Investigation
RME	-	Reasonable Maximum Exposure
RR	-	Raritan River
SA	-	Skin Surface Area
SF	-	Slope Factors
SPD	-	Sayreville Pesticide Dump
SQL	-	Sample Quantitation Limit
SSC	-	Suspended Soil Concentration
SVOC	-	Semi-volatile Organic Compound
TAL	-	Target Analyte List
TCL	-	Target Compound List
TCLP	-	Toxicity Characteristic Leaching Procedure
TDS	-	Total Dissolved Solids
TKN	-	Total Kjeldahl Nitrogen
TOC	-	Total Organic Carbon
TSS	-	Total Suspended Solids
UCL	-	Upper Confidence Limit
VOC	-	Volatile Organic Compound

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## 1.0 INTRODUCTION

CDM FEDERAL PROGRAMS CORPORATION (CDM Federal) received Work Assignment Number 085-2C0BT under the ARCS II program to perform a Remedial Investigation/Feasibility Study (RI/FS), including a Risk Assessment (RA) for the United States Environmental Protection Agency, Region II (EPA) at the Horseshoe Road Complex Superfund site located in Sayreville, New Jersey. The purpose of the RI/FS is to evaluate the overall nature and extent of contamination at the site and to develop and evaluate remedial alternatives, as appropriate. The purpose of the RA is to provide an analysis of baseline risks to determine the need for remedial action at the site and to serve as a basis for determining cleanup levels which will adequately protect human health and the environment. Both a baseline human health risk assessment (HHRA) and an ecological risk assessment (ERA) will be completed.

### 1.1 SCOPE OF RISK ASSESSMENT

Task 5.5.2 of the Final Work Plan (dated June 1997) required the preparation and submittal to EPA of a Human Health Risk Assessment (HHRA). CDM submitted a Pathway Analysis Report (PAR) to EPA in July 1998. The PAR specified the conceptual approach that would be used to evaluate the potential human health risks associated with the site. The following are the components of the HHRA as specified in the work plan:

- Data Collection and Evaluation
- Exposure Assessment
- Toxicity Assessment
- Risk Characterization
- Uncertainties in risk assessment
- Preliminary remediation goals (PRGs)

### DATA COLLECTION AND EVALUATION

The first step of the Risk Assessment, Data Collection and Evaluation, is Section 2.0 of this report. This section includes a summary of site sample data collected as part of CDM's RI (Appendix A). Subsets of the chemicals of concern (COCs) identified in each environmental matrix (i.e., soil, sediment, surface water, and building materials) and Area of Concern (AOC) were selected for detailed analysis. The primary selection criteria for these chemicals included 1) the chemical concentrations in various media; 2) a chemical concentration-toxicity screen (Appendix B); 3) the frequencies of detection; 4) the physical/chemical parameters; 5) the degree of toxicity, mobility, and persistence in the environment; and 6) historical information about site activities and the chemicals reliably associated with these activities. Media- and AOC-specific COCs are presented in Appendix C.

## **EXPOSURE ASSESSMENT**

In the second step, Exposure Assessment, qualitative or quantitative estimates of the magnitude, frequency, duration, and routes of exposure were made. Numerous pathways through which chemical contaminants could possibly migrate from potential sources to existing receptors were identified. Receptor groups (i.e., human populations) that might potentially be exposed as a result of the presence of one or more chemicals in the environment were also identified. Typically, these receptor populations include persons who might be exposed via ingestion of, dermal contact with, or inhalation of a contaminated medium, such as surface soil. Receptors who might be exposed under present or potential future land or water use scenarios were evaluated, as appropriate.

Exposure point concentrations for COCs were estimated based on the 95 percent Upper Confidence Limit (UCL) on the arithmetic mean (Appendix D). However, if the maximum detected concentration for a chemical was lower than the 95 percent UCL concentration, the actual maximum detected concentration was utilized in the estimation of chemical intakes. In such cases, the maximum detected concentration was used to prevent potential overestimation of potential human health impacts.

Daily chemical intakes via ingestion, dermal contact, or inhalation routes were quantitatively evaluated based on the 95 percent UCL estimate and site-specific, medium-specific, and receptor-specific intake variables. Chronic daily intakes were estimated in the Risk Assessment depending on the specific receptor population being evaluated. As previously stated, exposures were estimated for the reasonable maximum case exposure scenario (RME), which employs the 95 percent UCL (exposure point) concentration and RME assumptions. It should be noted that the Risk Assessment assumes that no reduction in exposure concentrations occurs due to natural physical/chemical processes, site remediation or institutional controls. The results of this evaluation are provided in the Exposure Assessment (Section 3.0) of the Risk Assessment.

## **TOXICITY ASSESSMENT**

The third step of the Risk Assessment is the Toxicity Assessment. The purpose of the toxicity assessment was to weigh available toxicological evidence regarding the potential for a particular chemical contaminant to cause adverse health effects in exposed individuals and to provide, where possible, an estimate of the relationship between the extent of exposure to a chemical contaminant and the increased likelihood and/or severity of adverse health effects (EPA, 1989a).

EPA has performed the toxicity assessment step for numerous chemicals and has made available the resulting toxicity information and toxicity values, which have undergone extensive peer review; however, data analysis and interpretation are still required. These established toxicity values were obtained from the Integrated Risk Information System (IRIS) data base (November 1998), which is updated monthly, or from the Health Effects Assessment Summary Tables (HEAST) FY 1997 - Annual, if no value was found in IRIS. The Superfund National Center for Environmental

Assessment (NCEA) was consulted for other specific chemical toxicity values, as directed by HEAST, when no value was shown.

A toxicity profile for each COC was developed using EPA toxicity assessments and accompanying values (Appendix E). When toxicity values were not available for a specific chemical, the chemical was qualitatively discussed. The toxicity values and the limitations of use of the toxicity values have been described in the Toxicity Assessment (Section 4.0) of the Risk Assessment.

## **RISK CHARACTERIZATION**

In the last step of the Risk Assessment process, Risk Characterization, the chronic daily intake for each chemical to which a given receptor group might be exposed is multiplied by the cancer slope factor to estimate potential risk since only the hazard index is calculated by a comparison. Quantitative estimates of the carcinogenic risks and noncarcinogenic health effects associated with each exposure pathway are presented for current and potential future land uses of the site.

The risks resulting from exposures to carcinogens were estimated based on the following assumptions (EPA, 1989a):

- A linear relationship exists between the intake of a carcinogenic substance over a lifetime and the risk of cancer (the linearized multistage model of carcinogenesis assumes that the dose-response relationship will be linear in the low-dose portion of the multistage model dose-response curve).
- Cancer risks from exposures to all carcinogens via all intake routes are additive.

The potential for noncarcinogenic effects was evaluated by comparing an exposure level over a specified time period with a reference dose derived for a similar exposure period. Section 5.0 of this Risk Assessment presents the Risk Characterization. Spreadsheet calculations are presented in Standard Tables 7 and 8 of this report.

## **UNCERTAINTIES IN RISK ASSESSMENT**

Because of the number of assumptions required during the Risk Assessment process, some degree of uncertainty is inevitably associated with the risk and hazard estimates. These uncertainties have been addressed both qualitatively and quantitatively (i.e., central tendency calculations) in Section 6.0, Uncertainties in Risk Assessment. Central tendency calculations are presented in Tables 7 and 8 of this report.

## PRELIMINARY REMEDIATION GOALS

Risk-based preliminary remediation goals (PRGs) are initial concentration goals for individual chemicals for specific medium and land use combinations. Whether PRGs are required for a site depends on the calculated site risk and hazard estimates, the existence of Applicable or Relevant and Appropriate Requirements (ARARs), and the existence of superseding EPA guidance on action levels. Generally, if risk and hazard estimates do not exceed the EPA target risk range of  $10^{-4}$  to  $10^{-6}$  for carcinogens or one for noncarcinogens, and PRGs are clearly defined by ARARs, PRGs need not be calculated for the Site. In addition, EPA may use its discretion to estimate PRGs where risks are between  $1.0E-04$  to  $1.0E-6$ . PRGs for this Site are presented in Appendix F and discussed in Section 7.0 of the Risk Assessment.

## SUMMARY

A summary of the results of the Risk Assessment is presented in Section 8.0 of this report.

## REFERENCES

The PAR and HHRA were prepared in accordance with EPA Region II and other EPA risk assessment guidance documents and the on-line data base listed below.

- *Risk Assessment Guidance for Superfund: Human Health Evaluation Manual, Part A* (EPA, 1989a).
- *Risk Assessment Guidance for Superfund: Human Health Evaluation Manual, Part D* (EPA, 1998a).
- *Exposure Factors Handbook* (EPA, 1997a).
- *Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors* (EPA, 1991a).
- *Guidance for Data Useability in Risk Assessment* (EPA, 1992a).
- *Dermal Exposure Assessment: Principles and Applications* (EPA, 1992b).
- *Health Effects Assessment Summary Tables FY-1997 Annual* (EPA, 1997b).
- *Integrated Risk Information System (On-line data base of toxicity measures)* (EPA, 1998b).

## **1.2 SITE DESCRIPTION AND HISTORY**

The Horseshoe Road Complex Site is located in Sayreville (Lots 1.01 and 1.03 in Block 246 and Lots 2.02 through 2.04 in Block 256), Middlesex County, New Jersey (Figure 1). The abandoned site (Figure 2), situated near the Raritan River, includes three adjoining areas of concern: (1) the Horseshoe Road Drum Dump (HRDD); (2) the Atlantic Development Corporation (ADC) Area; and (3) the Sayreville Pesticide Dump (SPD). The Atlantic Resource Corporation (ARC) is also located in the complex, but it is not part of the National Priorities List (NPL) site. The site, which consists of several abandoned industrial buildings and warehouses, is bordered to the north by the Raritan River, to the east by Conrail railroad tracks and easement, and to the west and south by wooded areas.

The area surrounding the site is used for both residential and industrial purposes. At least 47 residences are located within an one-mile radius of the site, while several hundred single family and multi-resident buildings are located within a two-mile radius. New Jersey Steel Corporation operates a facility approximately one-half mile to the southwest. The Middlesex County Utilities Authority (MCUA) operates a water treatment plant on the northern side of the site and a MCUA trunk line and a maintenance right of way cuts through the ARC and ADC properties. The Sayreville Water Company, which supplies water to approximately 14,000 people, maintains wells, recharge lagoons, and force mains several miles south of the site on Borden town Road.

For over 30 years, various operations were conducted at the Horseshoe Road Complex including the manufacturing of epoxy resins, roofing materials, paint pigments, and pharmaceuticals. Poor waste handling practices and the dumping of waste materials resulted in site-wide contamination. In addition, releases of copper, lead, methoxychlor, lindane, phenol, bis(2-ethylhexyl)phthalate, chloroform, 1,2-dichloroethane, and mercury to the Raritan River have also been reported.

Investigations by EPA and the New Jersey Department of Environmental Protection (NJDEP) have documented contamination of the site's surface and subsurface soil, surface water and sediment, and groundwater. Elevated levels of volatile organic, semivolatile organic, pesticide, dioxin, polychlorinated biphenyls (PCBs), and inorganic contamination have been detected in the site media.

To date, EPA has conducted more than nine removal actions that have addressed immediate public health threats and that have restricted site access. Removal actions, which began in 1987, included the removal of 3,000 drums, both buried and located on the ground surface, the remediation of mercury and dioxin spills, the removal and disposal of tank and vat materials, and the excavation and disposal of contaminated soils and debris.

The site was proposed for inclusion on the EPA Superfund NPL in June 1993 and was listed in September 1995.



## **2.0 DATA COLLECTION AND EVALUATION**

In the first step of the HHRA, Hazard Identification, the samples collected and the chemicals analyzed for, by medium, are discussed. The HHRA includes a summary of the locations sampled in the RI, the number of samples collected, and the analyses conducted on the samples from each media. As part of the RI, samples were collected from one stratigraphic boring sample, 12 surface soil samples, 187 soil boring samples, 15 DNAPL soil samples and one DNAPL groundwater sample, and 38 test pit samples; two rounds of groundwater samples (19 monitoring wells and 40 samples); one supplementary groundwater sampling round from seven newly installed wells (eight samples); nine groundwater screening samples from eight LNAPL/groundwater screening borings; one round of surface water samples from 27 locations (29 samples); one round of sediment samples from 39 locations (42 samples); 45 samples of building flooring and underlying soils; and 11 building material and building dust samples. Sample locations are presented in Figure 3 (surface soil, soil boring, DNAPL borings, LNAPL and groundwater screening borings, building flooring, test pits, and shallow monitoring wells), and Figure 4 (surface water, sediment, and building material).

### **2.1 MEDIA TO BE EVALUATED**

The environmental media to be quantitatively evaluated in the HHRA include surface soil, subsurface soil, groundwater, surface water, sediment, and building materials. Air is discussed qualitatively in the HHRA. The following is a summary of specific data sets for each medium to be used in the evaluation of present and potential future human health risks.

#### **2.1.1 SOIL**

##### **Surface Soil**

In October 1997, surface soil samples were collected at eleven locations at the site. The samples included two background samples (SS01 and SS02), four samples (SS03 through SS06, and SS20 (duplicate of SS03)) from ADC, and six samples (SS07 through SS11) from ARC. All of the surface soil samples were analyzed for Target Compound List (TCL) VOCs, TCL Extractables, and Target Analyte List (TAL) Metals, Toxicity Characteristic Leaching Procedure (TCLP) - TC VOCs, - TC Extractables, - TC Inorganics. In addition, 8 of 11 samples were also analyzed for hexavalent chromium, dioxin, total organic carbon (TOC), pH, and grain size. Two aqueous field blanks were collected with the surface soil samples. The field blank samples were analyzed for TCL VOCs, TCL Extractables, TAL Inorganics, hexavalent chromium, and dioxin.

Surface soil samples were also collected from the shallow depth (0 to 1 foot) of soil borings. Seven samples were collected from HRDD, 14 from ADC, 15 from SPD, and 13 from ARC.

Summaries of the surface soil data collected from each AOC are presented in Appendix A.

## **Subsurface Soil**

In November and December 1997, soil borings were conducted at 49 locations at the site. Seventeen borings were installed in SPD. Fifteen (15) borings were installed in ADC. Six borings were installed in HRDD. Twelve borings were installed in ARC. Please note that soil boring SB-22 was counted in both ARC and HRDD. Multiple samples (3 to 5) were collected from each boring. Samples were typically collected at a shallow depth (0 to 1 foot), intermediary depths (one to three samples) ranging from 2 to 24 feet, and a deep depth (28 to 30 feet or 32 to 34 feet). A total of 187 soil boring samples were collected, including eleven duplicate samples. CDM Federal also collected one sample (2 to 4 feet below ground surface) from the stratigraphic boring STB-2.

Each soil boring sample, including the stratigraphic boring sample, was analyzed for TCL VOCs, TCL Extractables, and TAL Inorganics. Twenty-eight selected samples were analyzed for additional analytes, including TCLP-TC VOCs, -TC Extractables, and -TC Metals, hexavalent chromium, TOC, pH, and grain size. In addition, 17 aqueous field blank samples were collected. Field blank samples were analyzed for TCL VOCs, TCL Extractables, TAL Inorganics, and hexavalent chromium, when applicable.

Summaries of the subsurface soil data collected from each AOC are presented in Appendix A.

## **Test Pits**

Test pits were excavated at twelve locations at the site in January 1998. Six test pits were excavated in SPD. Six test pits were excavated in HRDD. Two to seven samples were collected from each test pit. A total of 38 test pit samples were collected, including 34 soil samples, 2 aqueous samples, and 2 soil duplicate samples. Each test pit soil sample was analyzed for TCL VOCs, TCL Extractables, and TAL Inorganics. One of the aqueous samples was analyzed by Method 8321A and HPCL, and the second aqueous sample was analyzed as a corrosive liquid. Seven aqueous field blank samples were collected and analyzed for TCL VOCs, TCL Extractables, and TAL Inorganics.

Summaries of the test pit soil data collected from each AOC are presented in Appendix A.

### **2.1.2 GROUND WATER**

Two rounds of groundwater sampling of 19 monitoring wells were conducted at the site. The sampling rounds occurred in February 1998 and March 1998. After a review of the initial data, CDM Federal installed seven additional monitoring wells. These seven wells were sampled in June 1998. Five wells are located at SPD, including two background wells. Seven wells are located at ADC. Eight wells are located at ARC. Four wells are located at HRDD. Several monitoring wells monitor more than one AOC, therefore, these wells are counted more than once.



Samples were also collected, during the February sampling round, from the four MCUA wells that are adjacent to the site's northern boundary. Twenty groundwater samples were collected during each round, including one duplicate sample, during the first two sampling rounds. Eight groundwater samples, including one duplicate, were collected during the supplemental sampling round.

All groundwater samples were analyzed for low concentration VOCs, TCL Extractables, TAL Inorganics, nitrate/nitrite, ammonia, total Kjeldahl nitrogen (TKN), biological oxygen demand (BOD), chemical oxygen demand (COD), TOC, total dissolved solids (TDS), total suspended solids (TSS), alkalinity, methane, ethane, ethene, sulfate, chloride, and iron ( $\text{Fe}^{+2}$ ). In the February and March sampling rounds, ten blanks were collected. In the supplemental sampling round, seven blanks were collected, including one method, three field, and three trip blanks.

Summaries of the groundwater data collected from each AOC are presented in Appendix A.

### **LNAPL Borings / Groundwater Screening Points**

A total of eight LNAPL Borings / Groundwater Screening Points were installed to screen the water table to identify floating product in the vicinity of identified potential source area. Five screening points were located in ADC, three were in SPD, and one was located in ARC. Several locations are part of more than one AOC and, therefore, the sample numbers are counted twice. One groundwater sample was collected from each groundwater screening point. A total of nine samples, including one duplicate, were collected. Samples were analyzed for TCL VOCs and TCL SVOCs. One aqueous field blank sample was collected and analyzed for TCL VOCs and TCL SVOCs. One trip blank was analyzed for TCL VOCs.

### **2.1.3 SURFACE WATER**

Surface water samples were collected from 27 locations in October 1997. Three surface water locations were in SPD, twelve in ADC, eight in ARC, two in HRDD, three from locations along the Raritan River, and one in the Downstream Marsh (DSM). Several locations are part of more than one area of concern and, therefore, the sample numbers are counted twice. Thirty surface water samples were collected, including three background and three duplicate samples. Each surface water sample was analyzed for TCL VOCs, TCL Extractables, TAL Inorganics, TDS, alkalinity, and hardness. Nine samples were also analyzed for hexavalent chromium. Six trip blank samples were also collected and analyzed for TCL VOCs.

Summaries of the surface water data collected from each AOC are presented in Appendix A.

### **2.1.4 SEDIMENT**

Sediment samples were collected at the same 27 locations as surface water samples. Twelve

additional sediment samples were collected at ADC (3), DSM (2), HRDD (4), and ARC (1), and Raritan River (3). Several locations are part of more than one area of concern and, therefore, the sample numbers are counted twice. Two duplicate sediment samples and six aqueous field blank samples were also collected. Sediment samples were analyzed for TCL VOCs, TCL Extractables, TAL Metals, pH, TOC, and grain size. Thirteen sediment samples were also analyzed for hexavalent chromium and dioxin. Field blank samples were analyzed for TCL VOCs, TCL Extractables, TAL Inorganics, hexavalent chromium, and dioxin.

Summaries of the sediment data collected from each AOC are presented in Appendix A.

## **2.1.5 BUILDING MATERIALS**

### **Building Flooring**

Building flooring samples were collected at 13 locations in November 1997 and January 1998. Seven of these locations are in the ADC and six are in the ARC. At each location, a sample of the concrete floor and two or three samples of the soil under the floor were collected. Soil samples were collected up to 6 to 8 feet below ground surface. A total of 45 samples were collected, including six duplicate samples. Floor and soil samples were analyzed for TCL VOCs, TCL Extractables, TAL Inorganics. Floor samples were also analyzed for TCLP - TC VOCs, - TC Extractables, - TC Inorganics, corrosivity, reactivity, and ignitability. Five aqueous field blank samples were collected and analyzed for TCL VOCs, TCL Extractables, and TAL Inorganics.

### **Building Material and Building Dust**

Building material and dust samples were collected in October 1997. Six locations were in ARC and four locations were in ADC. Eleven samples, including one duplicate, were collected and analyzed for TCL VOCs, TCL Extractables, TAL Inorganics, TCLP- TC VOC, - TC Extractables, - TC Inorganics, corrosivity, reactivity, ignitability, dioxin, and hexavalent chromium. Two aqueous field blank samples were collected and analyzed for TCL VOCs, TCL Extractables, TAL Inorganics, dioxin, and hexavalent chromium.

Summaries of the building floor and subsurface soil, and building material and dust data collected from each AOC are presented in Appendix A.

## **2.2 TREATMENT OF DATA**

Summaries of the data from each environmental media by AOC are presented in Appendix A. The tables include the frequency of detection, the range of detected concentrations, the location of the maximum detected concentration, and the range of non-detect concentrations for each detected chemical. The frequency of detection is reported as the number of samples with detected concentrations divided by the number of analyzed samples. For the purposes of these tables when

evaluating duplicate results, the sample result and duplicate result are counted as individual samples.

Blanks, including field, trip, and laboratory, and rejected data (i.e., qualified with "R") were not be included in the frequency tally or range of concentrations.

### **2.2.1 DATA QUALITY**

As part of the data evaluation process, the quality of data was evaluated in the data validation phase. All RI data were validated in accordance with EPA Region II data validation protocols. However, it should be noted that the data from certain samples and analytes were qualified. In general, data with qualifiers that indicate uncertainties in concentrations but not identity were utilized in this Risk Assessment. Rejected data, qualified with an "R", will not used in this Risk Assessment because the chemical's identity and concentration are uncertain. Data qualified with a "U" were used in this Risk Assessment, as appropriate, in producing data summary tables and in calculating 95 percent UCLs (as one-half the method detection limit).

The data qualifiers associated with the site's database are as follows:

- The "\*" qualifier indicates for inorganics that duplicate analysis was not within control limits.
- The "J" qualifier indicates for all chemicals that the reported concentration is estimated.
- The "B" qualifier indicates for organics that the reported concentration is estimated because it was detected in both the sample and in the associated blank; for inorganics, the "B" qualifier indicates that the reported value is less than the contract required detection limit but greater than the instrument detection limit.
- The "E" qualifier indicates for organics that the concentration exceeds the calibration range of the gas chromatograph/mass spectrometry (GC/MS) instrument; for inorganics, the "E" qualifier indicates that the value is estimated due to matrix interferences.
- The "N" qualifier for organics indicates that there is only presumptive evidence for their presence; for inorganics, the "N" qualifier indicates that the spiked sample recovery is not within control limits.
- The "D" qualifier for organics indicates that the chemical was identified in an analysis at a secondary dilution factor.
- The "U" qualifier for all chemicals indicates that the chemical was not detected at the reported detection limit.

## 2.3 CRITERIA FOR THE SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Because of the large number of chemicals detected at the site, those retained for quantitative analysis in this HHRA were selected as the most significant (i.e., greatest contributors to risks/hazards). A subset of the chemicals identified in each environmental matrix (i.e., surface soil, subsurface soil, sediment, surface water, and building/dust materials) and AOC were selected for detailed analysis. The primary selection criteria for these chemicals included 1) the chemical concentrations in various media; 2) a chemical concentration-toxicity screen; 3) the frequencies of detection; 4) the physical/chemical parameters; 5) the degree of toxicity, mobility, and persistence in the environment; and 6) historical information about site activities and the chemicals reliably associated with these activities.

The potential health impact of a chemical is influenced by the relationship of concentration and toxicity. A chemical detected at high concentrations that may exhibit low noncarcinogenic toxicity may have less impact on human health than a potential carcinogen detected at relatively low concentrations. Therefore, a chemical concentration - toxicity screening procedure was performed for all chemicals detected in the specific AOCs for surface soil, subsurface soil, surface water, sediment, and building materials to aid in the determination of which chemicals were likely to contribute significantly to potential risks and hazards (Appendix B).

Individual chemical scores (or risk factors) were calculated for each medium and AOC as follows:

$$R_{ij} = (C_{ij}) (T_{ij})$$

Where:

$R_{ij}$  = risk factor for chemical I in medium j  
 $C_{ij}$  = concentration of chemical I in medium j  
 $T_{ij}$  = toxicity value for chemical I in medium j  
(i.e., slope factor or 1/oral reference dose)

For conservatism, the maximum detected concentration of each chemical was used in the calculation (EPA, 1989a). For the purposes of these tables when evaluating duplicate results, the sample result and duplicate result are considered as individual concentrations. The chemical-specific risk factors per area were summed to obtain a total risk factor for all chemicals for each area. Separate total risk factors were calculated for carcinogens (using the appropriate slope factors) and noncarcinogens (using the appropriate oral reference doses). The ratio of the risk factor for each chemical in each area in a medium to the total risk factor for each area in a medium provided the relative contribution from each chemical in each area in a medium. A contribution of 1 percent was used as a lower limit and chemicals contributing at least 1 percent were selected as COCs (EPA, 1989a).

For the evaluation of chromium in the concentration-toxicity screens, total chromium was speciated into its +3 and +6 valence states using a ratio of 6:1, respectively, per the IRIS data base. However,

actual site data indicates the hexavalent chromium was not detected at the site. Therefore, all chromium is assumed to be in the +3 valence state.

No toxicity values (e.g., reference dose/cancer slope factor) for lead are currently available from EPA sources. However, the lead concentrations present in surficial soil were compared to EPA recommended lead screening levels of 400 ppm for residential settings and a range of 750 to 1750 ppm for commercial/industrial land uses.

The selected chemicals of concern (COCs) are presented in Appendix C.



### 3.0 EXPOSURE ASSESSMENT

The objective of this section is to present the analysis for selecting potential exposure pathways to be evaluated in the HHRA. An exposure pathway analysis describes the transport of a chemical from the source of release to the exposed individual. An exposure pathway links the sources, locations, and types of environmental patterns to determine significant pathways of human exposure. As defined in EPA's Risk Assessment Guidance for Superfund (RAGS), an exposure pathway has four elements:

- Source and mechanism of chemical release
- Release or transport mechanism
- Point of potential human contact (exposure point)
- Exposure route at the contact point

Numerous pathways through which chemical contaminants could possibly migrate from potential sources to existing receptors were identified. Receptor groups (i.e., human populations) that might potentially be exposed as a result of the presence of one or more chemicals in the environment were identified. Typically, these receptor populations include persons who might be exposed via ingestion of, dermal contact with, or inhalation of a contaminated medium, such as surface soil. Receptors who might be exposed under present or potential future land or water use scenario were evaluated.

The following presents the basic process for identifying and selecting exposure pathways in the PAR. An environmental medium contaminated by a previous release can be a contaminant source for other media. The identification of potential release mechanisms and receiving media were determined utilizing site histories and data from existing reports. Potential release sources, mechanisms of release, and receiving media that have been identified for the Horseshoe Road Complex Site include the following:

- Surface runoff from contaminated surface soil into surface water; episodic overland flow resulting from lagoon overflow, spills, or leaking containers; and seepage of contaminated groundwater into surface water.
- Leaching from surface or buried wastes into soil.
- Leaching from surface or buried wastes and contaminated soil into groundwater.
- Leaching from surface or buried wastes and contaminated soil into sediment; surface runoff and episodic overland flow from surface wastes and contaminated surface soil; and seepage of contaminated groundwater into sediment.
- Direct uptake of contaminated air, soil, groundwater, surface water, sediment, or other biota by biota.

- Volatilization of chemicals from surface soil, surface water, or spills into the air; and fugitive dust generation from contaminated surface soil or building materials.

The fate and transport of the chemicals from release media were then considered to identify media that are receiving or that may receive site-related chemicals. Points of potential contact with chemically contaminated media (or sources) by human receptors were then considered. After exposure points were identified, potential exposure routes (i.e., ingestion, dermal contact, inhalation) were selected.

### **3.1 IDENTIFICATION OF EXPOSURE PATHWAYS**

Complete exposure pathways for the Horseshoe Road Complex Site were selected by integrating the information above and are presented in Standard Table 1. Standard Table 4 presents the exposure variables to be used in the daily intake calculations for each complete exposure pathway.

#### **3.1.1 SOIL**

Surficial soil at the site may have been contaminated by direct spillage or from surface runoff. Subsurface soil may be contaminated as a result of leaching and downward migration of mobile contaminants. Exposure to soil contamination was considered for trespassers, residents, site workers, and construction workers under present- and potential future-use conditions. The ingestion, dermal contact, and inhalation routes of exposure have been considered for each of these receptors. Justification for the inclusion or exclusion of these exposure routes from quantitative evaluation is presented in Table 1.

Currently, there are no residents, site workers or construction workers at the site. There is both residential and commercial development within a one-mile radius of the site. The most likely current receptors for surficial soil are area residents/trespassers. Although ADC and ARC are completely surrounded by a chain link fence, with some minor institutional controls to prevent entry to the facility, entry to the site has occurred as evidenced by vandalism. According to the Sayreville Zoning Office, the site is located in an area that is currently zoned for heavy manufacturing and there are no future plans to change this zoning status. Therefore, surface soil may serve as both current and future exposure medium for trespassers, and a future exposure medium for site workers and construction workers. Ingestion, dermal contact, and inhalation of VOCs and particulates are potential exposure routes for surficial soil.

Subsurface soil is not an exposure medium under present-use conditions, since construction activities involving excavation are not currently in progress at the site. In the future, if excavation activities or significant soil erosion occurs and land use is unchanged or developed for commercial/industrial uses, potential receptors are trespassers, site workers, and construction workers. Potential exposure routes are ingestion, dermal contact, and inhalation of VOCs and particulates.

Per EPA Region II CERCLA guidance, arsenic, cadmium, chlordane, DDT, TCDD (dioxin), PAHs



(benzo(a)pyrene), PCBs (Aroclor 1254 and 1242), pentachlorophenol, generic default for SVOCs, and inorganics were quantitatively evaluated for the dermal contact pathway for the soil matrix.

The inhalation of VOCs pathway was eliminated from the risk assessment based on the results of the soil chemical concentration-toxicity screens and the selected chemicals of potential concern. Almost all of the COCs for soils were nonvolatiles (PAHs, PCBs, pesticides, and inorganics).

### **3.1.2 GROUNDWATER**

Potable water is supplied to the Borough of Sayreville by the Sayreville Water Company, which maintains wells (drawing from the Old Bridge Member) and recharge lagoons within several miles south of the south. Although residences within the vicinity of the site are connected to the Borough of Sayreville's municipal water system, it is not known if some residents use residential well water for non-potable purposes. Although the potential exists for the site to be redeveloped for commercial/industrial uses, it is not likely that the site would be disconnected from the municipal water system and site groundwater used for potable uses.

In addition, the Conceptual Hydrogeologic Model developed for the site (Section 3.5.4 of the RI report) indicates the site is near the top of the Woodbridge clay unit. Regionally, the Woodbridge clay is part of an aquiclude that separated the Farrington and Old Bridge aquifers. The Farrington aquifer does not exist below the Woodbridge clay at the site. The Old Bridge Sand outcrops to the south, where it is both stratigraphically and topographically higher than the site. Therefore, the Horseshoe Road site is hydraulically isolated from the two regional aquifers.

Therefore, there is no complete exposure pathway for site groundwater under current and foreseeable future uses of the site. Justification for the inclusion or exclusion of scenarios for quantitative evaluation is presented in Table 1.

### **3.1.3 SURFACE WATER**

Historical sampling at the site indicated surface water and sediment contamination. Onsite surface water and sediment (e.g., pond, stream, drainage channels and wetlands) and associated surface water run-off may currently be contacted by area residents/trespassers. Run-off from the site into the Raritan River may potentially pose a threat to residents using the river for recreational purposes and ingesting shellfish caught in the river. In the future, the area along the Raritan River may be developed into a public area, including a boardwalk, park, and retail shops. Incidental exposure to surface water may occur in this developed area. The potential exposure routes include ingestion of and dermal contact with surface water. Inhalation of VOCs released from surface water was eliminated as a pathway from the risk assessment based on the results of the surface water chemical concentration-toxicity screens and the selected chemicals of potential concern. Almost all of the COCs for surface water are nonvolatiles (inorganics). Justification for the inclusion or exclusion of scenarios for quantitative evaluation is presented in Table 1.

### 3.1.4 SEDIMENT

Current receptors for sediment in onsite water bodies and the Raritan River include area residents/trespassers. Potential future receptors include residents who may come in direct contact with sediment during recreational activities. In the future, the area along the Raritan River may be developed into a public area, including a boardwalk, park, and retail shops. Incidental exposure to sediment may occur in this developed area. The potential exposure routes include ingestion of and dermal contact with sediment. Justification for the inclusion or exclusion of scenarios for quantitative evaluation is presented in Table 1.

### 3.1.5 BUILDING MATERIAL AND DUST

In the future, redevelopment of the site for commercial/industrial uses may occur. If the existing buildings are used, site and construction workers may be potentially exposed to building materials. The potential exposure routes are ingestion and dermal contact. Workers are not likely to be exposed to building floor concrete and subsurface soils below the floor, therefore exposure to these surfaces were not quantitatively evaluated. In general, concentrations of compounds were detected at higher concentrations in building materials, than the building floor concrete and soils below the floor. Therefore, the risks calculated for site workers and construction workers should be protective of less frequent exposures to these other surfaces. Justification for the inclusion or exclusion of scenarios for quantitative evaluation is presented in Table 1.

## 3.2 EXPOSURE POINT CONCENTRATIONS

Concentrations at potential exposure points (any point of potential contact with a contaminated medium) were developed for each COC and AOC in surface soil, subsurface soil, surface water, sediment, and building materials for use in calculation of daily intakes. Because of the uncertainty associated with any estimate of exposure concentration, the 95 percent UCL on the arithmetic mean is used for this variable. If there is a large variability in measured or modeled concentrations, the 95 percent UCL may exceed the maximum measured or modeled values, in which case, the maximum detected or modeled value is used. Although this concentration does not reflect the maximum concentration that could be contacted at any one time, it is considered a reasonable estimate of the concentration likely to be contacted over time, because long-term contact with the maximum concentration is not a reasonable assumption.

For the site's database, a lognormal distribution was assumed. The formula used to calculate the 95 percent UCL for a lognormal distribution is as follows:

$$UCL = e^{(x + 0.5s^2 + sH/\sqrt{n-1})}$$

Where:

UCL = upper confidence limit  
e = constant (base of the natural log, equal to 2.718)

x	=	mean of the transformed data
s	=	standard deviation of the transformed data
H	=	H-statistic (i.e., from table published in Gilbert, 1987)
n	=	number of samples

In calculating this value, non-detects were accounted for by using one-half the SQL. If one-half the SQL exceeded the maximum detection, the maximum detection was utilized as the default value.

Duplicate samples were averaged prior to calculating the UCLs. The average concentrations is presented in the UCL tables as "Sample ID-AV". EPCs for subsurface soils were based on samples collected from less than 15 feet. Depths of greater than 15 feet are deeper than the depth of typical excavation activities.

Appendix D presents the calculated 95 percent UCL concentrations used to estimate carcinogenic risks and noncarcinogenic hazards. Standard Tables 3.1 through 3.5 present the medium-specific exposure point concentration summaries.

### **3.3 CALCULATION OF DAILY INTAKES**

To assess the potential carcinogenic risks and health hazards to human populations quantitatively based on the present-use and potential future-use scenarios discussed in Section 3.1, daily intakes were calculated. For daily intakes, intakes are averaged over a lifetime for carcinogenic chemicals and over the period of exposure for noncarcinogens. The daily intake is expressed in terms of the mass of the chemical contaminant per unit of body weight over the averaging time (mg chemical/kg body weight-day).

Equations presented and described in RAGS (EPA, 1989a) were used to estimate daily intakes from ingestion and dermal contact exposures. These equations and values used for daily intake calculations are presented in Standard Tables 4.1 through 4.13.



## 4.0 TOXICITY ASSESSMENT

In the toxicity assessment portion of the risk assessment, the relationship between the potential level of exposure (dose) and the likelihood and/or severity of adverse effects (response) were evaluated. As part of this evaluation, available toxicity values or dose/response parameters for the chemicals detected at the site were compiled. These dose/response parameters were used in the chemical concentration-toxicity screens and integrated with chemical intake levels derived in exposure assessment to characterize the level of potential risks and health effects.

Dose/response parameters have been developed by EPA for the evaluation of both noncarcinogenic and carcinogenic effects of exposure to humans. The oral and inhalation reference doses (RfDs) are the toxicity values used to evaluate noncarcinogenic effects resulting from exposure. The oral and inhalation cancer slope factors (CSFs) are used to evaluate potential carcinogenic effects. Oral RfDs and inhalation reference concentrations (RfCs), as well as SFs derived for oral and inhalation exposures, are available through EPA's on-line Integrated Risk Information System (IRIS) and Health Effects Assessment Summary Tables (HEAST) Annual FY-1997. When a value was not available through these sources, the EPA's National Center for Environmental Assessment (EPA-NCEA) was consulted.

### 4.1 NONCARCINOGENIC EFFECTS

#### 4.1.1 DEFINITION AND DERIVATION OF REFERENCE DOSES

Toxicity values are available depending on the exposure route (oral or inhalation), the critical effect, and the length of exposure (e.g., chronic) to be evaluated. Chronic and subchronic oral and inhalation RfDs may be used to evaluate noncarcinogenic effects. A chronic RfD is defined as an estimate of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of harmful effects during a lifetime. Chronic RfDs are specifically developed to be protective of long-term exposure to a chemical, and are defined as exposure periods exceeding seven years (approximately ten percent of a human lifetime of 70 years). Subchronic RfDs are used to characterize potential noncarcinogenic effects associated with shorter-term exposure periods between 2 weeks and approximately 7 years.

RfDs are derived by EPA based on the concept of a threshold. For many noncarcinogenic effects, protective mechanisms may exist which must be overcome before an adverse effect is manifested. A range of exposure levels may be tolerated by an organism before an adverse effect occurs. In the development of the RfDs, human epidemiological and clinical studies, and experimental animal studies are reviewed to identify the upper-bound of the tolerance range (i.e., maximum subthreshold level) which is protective of sensitive individuals in the population. The no observed adverse effect level (NOAEL) or lowest observed adverse effect level (LOAEL) is generally used to describe this level and is the basis for the derivation of the RfD. Uncertainty and modifying factors are then applied to the NOAEL, depending on the quality and the applicability of the available animal or human toxicity study, as the final step in the derivation of the RfD. The resultant oral RfD is

expressed in terms of unit concentration of a chemical (mg) per unit body weight (kg) per unit time (day) or mg/kg/day.

Inhalation RfCs, expressed in  $\text{mg}/\text{m}^3$ , are derived by interim methods adopted by EPA in 1988. These methods differ slightly from those used for the derivation of RfDs because of (1) dynamics of the respiratory system and its diversity across species, and (2) differences in physicochemical properties of chemical contaminants, such as size and shape of a particle. The RfC value is reported as a concentration in air ( $\text{mg}/\text{m}^3$ ), although it may be converted to a corresponding inhaled dose ( $\text{mg}/\text{kg}/\text{day}$ ) by dividing by 70 kg body weight and multiplying by  $20 \text{ m}^3/\text{day}$  inhalation rate.

#### **4.1.2 RfDs FOR DETECTED CHEMICAL CONTAMINANTS**

Chronic oral RfDs, primary target organs, and the uncertainty factors associated with them for chemicals detected in historical site investigations are presented in Standard Table 5.1. These RfDs were used in the concentration-toxicity screens to select contaminants of concern (COCs), and in the calculation of ingestion and dermal noncarcinogenic hazard quotients (Standard Table 7). No COCs were evaluated for inhalation exposures, therefore, no inhalation reference concentrations were applicable (Standard Table 5.2). In addition, no special case chemicals were evaluated, therefore, no toxicity values were applicable for special case chemicals (Standard Table 5.3).

### **4.2 CARCINOGENIC EFFECTS**

#### **4.2.1 DEFINITION AND DERIVATION OF SLOPE FACTORS**

The carcinogenic slope factor and the accompanying weight-of-evidence classification are used to evaluate potential human carcinogenic risks associated with exposures. The hypothesized mechanism of carcinogenesis is based on the concept of nonthreshold effects (i.e., there is essentially no level of exposure to a chemical that does not pose some probability of generating a carcinogenic response).

In defining the potential carcinogenicity of a chemical contaminant to humans, EPA first evaluates the sufficiency of evidence of carcinogenicity from available data. The evidence is characterized separately for human and animal studies as sufficient, limited, adequate, no data, or evidence of no effect. The characterizations of these two sets of data are evaluated in combination and the chemical is assigned a "weight-of-evidence" classification. EPA has five groups of classification which are as follows:

- A - Human Carcinogen.
- B1 - Probable Human Carcinogen. Limited human data are available.
- B2 - Probable Human Carcinogen. Sufficient evidence of carcinogenicity in animals and inadequate or no evidence in humans.
- C - Possible Human Carcinogen.
- D - Not Classifiable as to human carcinogenicity.

E - Evidence of noncarcinogenicity for humans.

For Group A, B1, and B2 carcinogens, EPA typically derives a carcinogenic slope factor. Slope factors for Class C carcinogens are derived on a case-by-case basis. The slope factor defines quantitatively the relationship between dose and response as the plausible upper-bound estimate of the probability of a response (i.e., development of cancer) per unit intake of a potential carcinogen over a lifetime.

The slope factor is derived by EPA by selecting the most appropriate data set, extrapolating to lower doses, determining equivalent human doses for the appropriate route of exposure (ingestion or inhalation), and application of uncertainty factors. The resultant slope factor is expressed in terms of risk per unit concentration of the chemical (mg) per unit body weight (kg) per unit time (day) or  $(\text{mg/kg/day})^{-1}$ .

#### **4.2.2 SLOPE FACTORS FOR DETECTED CHEMICAL CONTAMINANTS**

Oral slope factors and weight-of-evidence classifications for potentially carcinogenic chemicals detected in historical site investigations are presented in Standard Table 6.1. These cancer slope factors (CSFs) were used in the concentration-toxicity screens to select contaminants of concern (COCs), and in the calculation of ingestion and dermal carcinogenic risks (Standard Table 8). No COCs were evaluated for inhalation exposures, therefore, no inhalation slope factors were applicable (Standard Table 6.2). In addition, no special case chemicals were evaluated, therefore, no toxicity values were applicable for special case chemicals (Standard Table 6.3).





## 5.0 RISK CHARACTERIZATION

In this section of the risk assessment, toxicity and exposure assessments were integrated into quantitative and qualitative expressions of carcinogenic risk and noncarcinogenic hazards. The estimate of risk and hazard were expressed numerically in spreadsheets contained in Standard Tables 7 and 8. Tables represent the reasonable maximum exposure as indicated by the abbreviation RME after the table number.

The potential for noncarcinogenic effects was evaluated by comparing an exposure level over a specified time period with a reference dose derived for a similar exposure period. This ratio of exposure to toxicity is referred to as a hazard quotient. The hazard index is the sum of the HQs. This hazard index assumes that there is a level of exposure below which it is unlikely even for sensitive populations to experience adverse health effects. If the hazard index exceeds 1, there may be concern for potential noncancer effects, however, this value should not be interpreted as a probability. Generally, the greater the hazard index above unity, the greater the level of concern. Calculation of non-cancer hazards are presented in Standard Tables 7.1 through 7.13.

Carcinogenic risks are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen. Per RAGS guidance, the slope factor converts estimated daily intakes averaged over a lifetime of exposure directly to incremental risk of an individual developing cancer. This carcinogenic risk estimate is generally an upper-bound value since the slope factor is often an upper 95<sup>th</sup> percentile confidence limit of the probability of response based on experimental animal data used in the multistage model. Calculation of cancer risks are presented in Standard Tables 8.1 through 8.13.

In general, EPA recommends a target value or a risk range (i.e., hazard index = 1 or risk =  $10^{-4}$  to  $10^{-6}$ ) as threshold values for potential human health impacts. The results presented in the spreadsheet calculations were compared to these target values. These values aid in determining the objectives of the baseline risk assessment which include determining whether additional response action is necessary at the site, by providing a basis for determining residual chemical levels that are adequately protective of human health, by providing a basis for comparing potential health impacts of various remedial alternatives, and to help support selection of the no-action remedial alternative, where appropriate.

Carcinogenic risks and noncarcinogenic hazard indices are summarized for each receptor by medium, exposure route, and exposure point (Standard Table 9).

A summary for each receptor by medium, exposure route, and exposure point that trigger the need for cleanup are presented in Standard Table 10.

## **5.1 QUANTITATIVE RESULTS OF CARCINOGENIC RISK AND NONCARCINOGENIC EFFECTS EVALUATION**

### **5.1.1 AREA RESIDENTS (TRESPASSERS)**

The results of carcinogenic risk and noncarcinogenic hazard index calculations for current and future area residents (trespassers) are presented in Standard Table 9.1. For AOC 1 - HRDD, exposures to area residents (trespassers) were evaluated for surface soil, surface water, and sediment. The total risk across all media and all exposure routes is  $2.3\text{E-}05$ . The total hazard index across all media and all exposure routes is 0.71.

For AOC 2 - ADC, exposures to area residents (trespassers) were evaluated for surface soil, building materials, surface water, and sediment. The total risk across all media and all exposure routes is  $3.2\text{E-}04$ . This risk is primarily attributed to carcinogenic PAHs in building materials. The total hazard index across all media and all exposure routes is 3.3. The total HI for the skin is 3.1 attributed to arsenic in surface soil and sediment. In addition, lead was detected in surficial soils at concentrations exceeding EPA's recommended lead screening level of 400 ppm for residential settings.

For AOC 3 - SPD, exposures to area residents (trespassers) were evaluated for surface soil, surface water, and sediment. The total risk across all media and all exposure routes is  $1.0\text{E-}06$ . The total hazard index across all media and all exposure routes is 0.071.

For AOC 4 - ARC, exposures to area residents (trespassers) were evaluated for surface soil, building materials, surface water, and sediment. The total risk across all media and all exposure routes is  $3.3\text{E-}05$ . The total hazard index across all media and all exposure routes is 7.3. The total HI for whole body/blood is 6.0 attributed to antimony in building materials, and for immune system is 1.2 attributed to PCBs in sediment and building materials. In addition, lead was detected in surficial soils at concentrations exceeding EPA's recommended lead screening level of 400 ppm for residential settings.

For AOC 5 - DSM, exposures to area residents (trespassers) were evaluated for surface water, and sediment. The total risk across all media and all exposure routes is  $8.3\text{E-}05$ . The total hazard index across all media and all exposure routes is 2.1. The total HI for skin is 2.1 attributed to arsenic in sediment.

For AOC 6 - RR, exposures to area residents (trespassers) were evaluated for surface water, and sediment. The total risk across all media and all exposure routes is  $4.2\text{E-}05$ . The total hazard index across all media and all exposure routes is 1.1. The total HI for skin is 1.1 attributed to arsenic in sediment.

### 5.1.2 RESIDENTS

**Adults** - The results of carcinogenic risk and noncarcinogenic hazard index calculations for current and future adult residents are presented in Standard Table 9.2a. For AOC 5 - DSM, exposures to adult residents were evaluated for shellfish, surface water, and sediment. The total risk across all media and all exposure routes is  $3.9\text{E-}04$  attributed to arsenic in sediment. The total hazard index across all media and all exposure routes is 2.6. The total HI for skin is 2.6 attributed to arsenic in sediment.

For AOC 6 - RR, exposures to adult residents were evaluated for shellfish, surface water, and sediment. The total risk across all media and all exposure routes is  $1.9\text{E-}04$  attributed to arsenic in sediment. The total hazard index across all media and all exposure routes is 1.3. The total HI for skin is 1.2 attributed to arsenic in sediment.

**Children** - The results of carcinogenic risk and noncarcinogenic hazard index calculations for future child residents are presented in Standard Table 9.2b. For AOC 5 - DSM, exposures to child residents were evaluated for surface water, and sediment. The total risk across all media and all exposure routes is  $6.1\text{E-}04$  attributed to arsenic in sediment. The total hazard index across all media and all exposure routes is 16. The total HI for skin is 16 attributed to arsenic in sediment.

For AOC 6 - RR, exposures to child residents were evaluated for surface water, and sediment. The total risk across all media and all exposure routes is  $3.1\text{E-}04$  attributed to arsenic in sediment. The total hazard index across all media and all exposure routes is 8.1. The total HI for skin is 8.0 attributed to arsenic in sediment.

### 5.1.3 SITE WORKERS

The results of carcinogenic risk and noncarcinogenic hazard index calculations for future site workers are presented in Standard Table 9.3. For AOC 1 - HRDD, exposures to site workers were evaluated for surface soil, subsurface soil, and test pit soil. The total risk across all media and all exposure routes is  $1.3\text{E-}03$ . This risk is primarily attributed to PCBs in surface soil and test pit soil, and arsenic in test pit soil. The total hazard index across all media and all exposure routes is 13. The total HI for skin is 5.8 primarily attributed to arsenic in test pit soil, for whole body/blood is 3.5 attributed to antimony in test pit soil, and for the immune system is 3.1 primarily attributed to PCBs in test pit soil.

For AOC 2 - ADC, exposures to site workers were evaluated for surface soil, subsurface soil, and building materials. The total risk across all media and all exposure routes is  $3.4\text{E-}02$ . This risk is attributed to carcinogenic PAHs in surface soil, subsurface soil, and building materials, PCBs in surface soil and subsurface soil, arsenic in surface soil, subsurface soil, and building materials, and 1,2-dichloroethane in subsurface soil. The total hazard index across all media and all exposure routes is 41. The total HI for the skin is 34 attributed to arsenic in surface soil and subsurface soil, for kidney is 1.5 primarily attributed to fluoranthene and pyrene in building materials, and for

reproductive effects is 2.3 attributed to methoxychlor in surface soil and subsurface soil. Lead was detected in surficial soils at concentrations within EPA's recommended screening range of 750 to 1750 ppm for commercial/industrial uses.

For AOC 3 - SPD, exposures to site workers were evaluated surface soil, subsurface soil, and test pit soil. The total risk across all media and all exposure routes is  $7.9\text{E-}04$ . This risk is primarily attributed to hexachloroethane in test pit soil, PCBs in test pit soil, arsenic in surface soil, subsurface soil, and test pit soil, and carcinogenic PAHs in surface soil and test pit soil. The total hazard index across all media and all exposure routes is 68. The total HI for kidney is 63 attributed to hexachloroethane in test pit soil, and for the immune system is 2.6 attributed to PCBs in test pit soils.

For AOC 4 - ARC, exposures to site workers were evaluated surface soil, subsurface soil, and building materials. The total risk across all media and all exposure routes is  $2.7\text{E-}03$ . The total hazard index across all media and all exposure routes is 100. This risk is attributed to 2,3,7,8-TCDD equivalents in surface soil and building materials, arsenic in surface soil and building materials, PCBs in surface soil and building materials, and carcinogenic PAHs in surface soil. The total HI for whole body/blood is 84 attributed to antimony in building materials, for immune system is 14 attributed to PCBs in building materials, and for the skin is 2.2 attributed to arsenic in building materials. Lead was detected in surficial soils at concentrations exceeding EPA's recommended screening range of 750 to 1750 ppm for commercial/industrial uses.

#### **5.1.4 CONSTRUCTION WORKERS**

The results of carcinogenic risk and noncarcinogenic hazard index calculations for future construction workers are presented in Standard Table 9.4. For AOC 1 - HRDD, exposures to construction workers were evaluated for surface soil, subsurface soil, and test pit soil. The total risk across all media and all exposure routes is  $3.4\text{E-}05$ . The total hazard index across all media and all exposure routes is 10. The total HI for whole body/blood is 4.4 attributed to antimony in test pit soil, for skin is 4.3 primarily attributed to arsenic in test pit soil, and for the immune system is 1.2 attributed to PCBs in test pit soil.

For AOC 2 - ADC, exposures to construction workers were evaluated for surface soil, subsurface soil, and building materials. The total risk across all media and all exposure routes is  $5.9\text{E-}04$ . This risk is attributed to carcinogenic PAHs in building materials. The total hazard index across all media and all exposure routes is 28. The total HI for the skin is 26 attributed to arsenic in surface and subsurface soil, and for reproductive effects is 1.1 attributed to methoxychlor in surface soil and subsurface soil. Lead was detected in surficial soils at concentrations within EPA's recommended screening range of 750 to 1750 ppm for commercial/industrial uses.

For AOC 3 - SPD, exposures to construction workers were evaluated surface soil, subsurface soil, and test pit soil. The total risk across all media and all exposure routes is  $1.5\text{E-}05$ . The total hazard index across all media and all exposure routes is 31. The total HI for kidney is 28 attributed to

hexachloroethane in test pit soil, and for the immune system is 1.1 attributed to PCBs in test pit soil.

For AOC 4 - ARC, exposures to construction workers were evaluated surface soil, subsurface soil, and building materials. The total risk across all media and all exposure routes is  $7.6E-05$ . The total hazard index across all media and all exposure routes is 120. The total HI for whole body/blood is 110 attributed to antimony in building materials, for immune system is 5.5 attributed to PCBs in building materials, and for the skin is 1.7 attributed to arsenic in building materials. Lead was detected in surficial soils at concentrations exceeding EPA's recommended screening range of 750 to 1750 ppm for commercial/industrial uses.

## **5.2 COPCS AND MEDIA/EXPOSURE POINTS THAT TRIGGER THE NEED FOR CLEANUP**

Cancer risk and non-cancer hazard information for only those COPCs and media/exposure points that trigger the need for cleanup (the risk drivers) are presented in Standard Table 10. In accordance with the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) Section 300.430 (e)(2) for known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper-bound lifetime cancer risk to an individual of between  $10^{-4}$  and  $10^{-6}$ . Per RAGS Part B: Development of Risk-Based Preliminary Remediation Goals (USEPA, 1991b), for noncarcinogenic effects, the NCP does not specify a range, but it is generally appropriate to assume a hazard index equal to 1.

### **5.2.1 AREA RESIDENTS (TRESPASSERS)**

The COPCs and media/exposure points for current and future area residents (trespassers) that trigger the need for cleanup are presented in Standard Table 10.1.

For AOC 2 - ADC, total risk for area residents (trespassers) exceeds  $10^{-4}$  and the total HI exceeds 1.0. The risk exceedance is primarily attributed to carcinogenic PAHs in building materials. The HI exceedance is attributed to arsenic in surface soil and sediment. In addition, lead was detected in surficial soils at concentrations exceeding EPA's recommended lead screening level of 400 ppm for residential settings.

For AOC 4 - ARC, the total HI exceeds 1.0. The HI exceedance is primarily attributed to antimony in building materials. The individual HQs for Aroclor-1254 in building materials and sediment are less than 1. Lead was detected in surficial soils at concentrations exceeding EPA's recommended lead screening level of 400 ppm for residential settings.

For AOC 5 - DSM, the total HI exceeds 1.0. The HI exceedance is attributed to arsenic in sediment.

For AOC 6 - RR, the total HI exceeds 1.0. The exceedance is attributed to arsenic in sediment.

### 5.2.2 RESIDENTS

**Adults** - The COPCs and media/exposure points for current and future adult residents that trigger the need for cleanup are presented in Standard Table 10.2a.

For AOC 5 - DSM, total risk for adult residents exceeds 10<sup>-4</sup> and the total HI exceeds 1.0. The risk exceedance is attributed to arsenic in sediment. The HI exceedance is attributed to arsenic in sediment.

For AOC 6 - RR, total risk for adult residents exceeds 10<sup>-4</sup> and the total HI exceeds 1.0. The risk exceedance is attributed to arsenic in sediment. The HI exceedance is attributed to arsenic in sediment.

**Children** - The COPCs and media/exposure points for future child residents that trigger the need for cleanup are presented in Standard Table 10.2b.

For AOC 5 - DSM, total risk for child residents exceeds 10<sup>-4</sup> and the total HI exceeds 1.0. The risk exceedance is attributed to arsenic in sediment. The HI exceedance is attributed to arsenic in surface water and sediment.

For AOC 6 - RR, total risk for child residents exceeds 10<sup>-4</sup> and the total HI exceeds 1.0. The risk exceedance is attributed to arsenic in sediment. The HI exceedance is attributed to arsenic in sediment.

### 5.2.3 SITE WORKERS

The COPCs and media/exposure points for future site workers that trigger the need for cleanup are presented in Standard Table 10.3.

For AOC 1 - HRDD, total risk for site workers exceeds 10<sup>-4</sup> and the total HI exceeds 1.0. The risk exceedance is attributed to PCBs and arsenic in surface soil and test pit soil. The HI exceedance is attributed to primarily to antimony, PCBs and arsenic in test pit soil.

For AOC 2 - ADC, total risk for site workers exceeds 10<sup>-4</sup> and the total HI exceeds 1.0. The risk exceedance is attributed to carcinogenic PAHs in surface soil, subsurface soil, and building materials, arsenic in surface soil, subsurface soil, and building materials, and PCBs in surface and subsurface soil. The HI exceedance is attributed to arsenic and methoxychlor in surface and subsurface soil, and fluoranthene and pyrene in building materials.

For AOC 3 - SPD, total risk for site workers exceeds 10<sup>-4</sup> and the total HI exceeds 1.0. The risk exceedance is primarily attributed to hexachloroethane, PCBs, and arsenic in test pit soil. In addition, arsenic in surface soil and subsurface soil also attributed to the total risk exceedance. The HI exceedance is attributed to hexachloroethane and PCBs in test pit soil.

For AOC 4 - ARC, total risk for site workers exceeds 10<sup>-4</sup> and the total HI exceeds 1.0. The risk exceedance is primarily attributed to 2,3,7,8-TCDD, PCBs and arsenic in building materials. In addition, PCBs and arsenic in surface soil attributed to the total risk exceedance. The HI exceedance is attributed to antimony, PCBs, and arsenic in building materials. Lead was detected in surficial soils at concentrations exceeding EPA's recommended screening range of 750 to 1750 ppm for commercial/industrial uses.

#### **5.2.4 CONSTRUCTION WORKERS**

The COPCs and media/exposure points for future construction workers that trigger the need for cleanup are presented in Standard Table 10.4.

For AOC 1 - HRDD, the total HI for construction workers exceeds 1.0. The HI exceedance is attributed to primarily to antimony, PCBs and arsenic in test pit soil.

For AOC 2 - ADC, total risk for construction workers exceeds 10<sup>-4</sup> and the total HI exceeds 1.0. The risk exceedance is attributed to carcinogenic PAHs in building materials. The HI exceedance is attributed to arsenic and methoxychlor in surface and subsurface soil.

For AOC 3 - SPD, the total HI for construction workers exceeds 1.0. The HI exceedance is attributed to hexachloroethane, copper, and PCBs in test pit soil.

For AOC 4 - ARC, the total HI for construction workers exceeds 1.0. The HI exceedance is attributed to antimony, PCBs, and arsenic in building materials. Lead was detected in surficial soils at concentrations exceeding EPA's recommended screening range of 750 to 1750 ppm for commercial/industrial uses.





## 6.0 UNCERTAINTIES IN RISK ASSESSMENT

The primary areas of uncertainty and limitations are qualitatively discussed in this section. As in any risk assessment, the estimates of potential health threats (carcinogenic risks and noncarcinogenic health effects) for the Horseshoe Road Complex site has numerous associated uncertainties. In general, the primary areas of uncertainty include the following:

- Environmental data
- Exposure pathway assumptions
- Toxicological data
- Risk characterization

Uncertainty is always involved in the estimation of chemical concentrations. Errors in the analytical data may stem from errors inherent in sampling and/or laboratory procedures. One of the most effective methods of minimizing procedural or systematic error is to subject the data to a strict quality control review. This quality control review procedure helps to eliminate many laboratory errors. However, even with all data vigorously validated, it must be realized that error is inherent in all laboratory procedures.

The lack of site-specific exposure measurements requires that estimates be made on the basis of literature values and/or professional judgement. These types of estimates were required in the evaluation of exposure scenario input parameters. For example, assumptions were made for the exposure time, frequency, and duration of potential chemical exposures as well as for the quantity of ingested and/or inhaled chemical contaminants. In general, assumptions were made based on reasonable maximum exposures.

Other standard assumptions used throughout this risk assessment are assumed to represent average values (i.e., 70 kg average adult body weight) or upper-bounds of potential exposure (i.e., inhalation rate) and have been used as appropriate.

Other sources of error in the risk assessment can stem from the use of estimated concentrations and can arise during the calculation of 95 percent UCLs. For example, one-half the SQL was used in the 95 percent UCL calculation as a proxy concentration for non-detect chemicals per RAGS (USEPA, 1989a).

Toxicological data uncertainty is one of the largest sources of error in this risk assessment. Numerous uncertainties are associated with USEPA-derived toxicity values used in risk assessment. However, these uncertainties tend to be conservative by overestimating risks. One source of uncertainty may include using dose-response information from effects observed at high doses in animals to predict adverse health effects from low level exposures to humans in contact with the chemical in the environment. Another source may be the use of dose-response information from short-term exposure studies to predict the effects of long-term exposure and vice versa. Uncertainties may also arise from using dose-response information in animals to predict human

health effects and from homogeneous animal and healthy human populations to predict effects likely to be observed in the general population which consists of individuals with varying sensitivities. In addition, the inability to quantitatively evaluate all chemicals detected at the site due to the lack of sufficient toxicological data may result in underestimation of risks and/or health effects.

Other toxicological data uncertainty in this risk assessment includes the use of the benzo(a)pyrene oral slope factor in conjunction with relative potency values to develop slope factors for numerous other carcinogenic PAHs, the combining of carcinogens with different weights-of-evidence in the calculation of risk; and the combining of noncarcinogens with different toxicity endpoints in the calculation of hazard index values.

Uncertainty is also involved in the calculation of risk and hazard estimates via the dermal contact with soil pathway. Only specific chemicals could be quantitatively evaluated via this route since these are the only chemicals detected in site soil which have USEPA Region II recommended soil dermal absorption factors. The potential exists to underestimate risks/impacts via this pathway since all other chemicals detected in the soil could only be qualitatively addressed. An additional source of uncertainty may include the use of an oral reference dose to evaluate dermal exposure (i.e., arsenic, PCBs).

As a result of the uncertainties described above, this risk assessment should not be construed as presenting absolute risks or hazards. Rather, it is a conservative analysis intended to indicate the potential for adverse impacts to occur, based on a reasonable maximum exposure.

## **6.1 CENTRAL TENDENCY CALCULATIONS**

Central tendency is a statistical measure that identifies the single most representative value for an entire distribution of values. As a quantitative measure of uncertainty in this risk assessment, central tendency calculations have been performed utilizing 50<sup>th</sup> percentile input parameters (i.e., exposure duration) in the risk and hazard index calculations as opposed to the more conservative parameters generally used in risk assessment calculations. Ninetieth percentile input parameters are used in the risk assessment for calculation of risk and hazard index values in a given pathway so that the combination of all intake variables results in an estimate of the RME for that pathway. The RME is the maximum exposure that is reasonably expected to occur at a site.

The 50<sup>th</sup> percentile values used in the central tendency calculations are considered to be representative of the general receptor population, but may underestimate the true carcinogenic risk and/or noncarcinogenic health effects to sensitive receptors. Standard Table 4 presents the exposure parameters to be utilized in the calculation of central tendency for those exposure pathways which have results in exceedance of the 1.0E-04 for carcinogens and 1 for noncarcinogens. These parameters were based on RAGS (USEPA, 1989a), Exposure Factors Handbook (USEPA, 1997), Region II guidance.

Standard Tables 7.CT and 8.CT present the results of the central tendency calculations. The

receptors, media, and exposure pathways which have results in exceedance of the  $1.0E-04$  for carcinogens and 1 for noncarcinogens are summarized below and in Standard Tables 9.CT and 10.CT.

### **6.1.1 RESIDENTS**

**Children** - For AOC 5 - DSM, total risk for future child residents exceeds  $10^{-4}$  and the total HI exceeds 1.0. The risk and HI exceedance is attributed to arsenic in sediments.

For AOC 6 - RR, the total HI exceeds 1.0. The HI exceedance is attributed to arsenic in sediments.

### **6.1.2 SITE WORKERS**

For AOC 2, total risk for future site workers exceeds  $10^{-4}$  and the total HI exceeds 1. The risk exceedance is attributed to carcinogenic PAHs in building materials. For the total HI of 1.4, none of the HIs for specific target organs exceed 1.

For AOC 4, total risk for future site workers exceeds  $10^{-4}$  and the total HI exceeds 1. The risk exceedance is attributed to 2,3,7,8-TCDD equivalents and arsenic in building materials. The HI exceedance is primarily attributed to antimony in building materials.

### **6.1.3 CONSTRUCTION WORKERS**

For AOC 2, total risk for future construction workers exceeds  $10^{-4}$  and the total HI exceeds 1. The risk exceedance is attributed to carcinogenic PAHs in building materials.

For AOC 4, the total HI exceeds 1. The HI exceedance is attributed to antimony, PCBs, and arsenic in building materials.



## 7.0 PRELIMINARY REMEDIATION GOALS

### 7.1 DEFINITION OF PRELIMINARY REMEDIATION GOALS

Chemical-specific preliminary remediation goals (PRGs) are concentration goals for individual chemicals for specific medium and land use combinations at CERCLA sites. In this section, chemical-specific PRGs were developed based on the risk assessment (i.e., risk-based calculations). Available site-specific parameters were used in place of default parameters to reflect site-specific conditions. Risk-based PRGs are initial guidelines only; they do not establish that cleanup to these goals is warranted. A risk-based concentration will be considered a final remediation level after analysis in the RI/FS and ROD.

For this risk assessment, risk-based PRGs are needed for chemicals in medium with a cumulative cancer risk of greater than  $1.0\text{E-}04$  and where a hazard index is greater than 1. Upon review of the spreadsheet calculations for site soils, surface, sediment, and building materials several exceedances of the USEPA's target levels were noted. EPA will use its discretion to estimate PRGs where risks are between  $1.0\text{E-}04$  to  $1.0\text{E-}6$ .

The risk-based equations used reflect the potential risk from exposure to a chemical given a specific pathway, medium, and land use combination. By setting the risk at  $10^{-6}$  for a carcinogen and the hazard index equal to 1 for a noncarcinogen, the concentration term (risk-based PRG) can be calculated. The formulae to be used were obtained from the RAGS Human Health Evaluation Manual, Part B: Development of Risk-Based Preliminary Remediation Goals (EPA, 1991b) and site-specific equations and assumptions presented in Standard Table 4. Risk-based PRGs for the applicable carcinogenic and the noncarcinogenic compounds in site medium are presented in Appendix F.



## 8.0 SUMMARY OF THE BASELINE RISK ASSESSMENT

In this baseline human health risk assessment, the site matrices surface soil, subsurface soil, surface water, sediment, and building materials at the Horseshoe Road Complex site were quantitatively evaluated for potential health threats to human receptors via the ingestion and dermal contact routes of exposure. Receptors including trespassers (area residents), residents (adults and children), site workers, and construction workers were evaluated under present and potential future land use conditions, as appropriate. The estimates of risk and hazard and the greatest chemical contributors to these estimates have been presented and discussed.

Chemicals of potential concern were selected for each matrix based on criteria outlined in RAGS (USEPA, 1989a) and are presented in Appendix C. The chemicals of potential concern included VOCs, SVOCs, pesticides, PCBs, and inorganics. The essential nutrients (i.e., calcium, magnesium, potassium, and sodium) were not quantitatively addressed as their potential toxicity is significantly lower than other inorganics at the site, and most existing toxicological data pertain to dietary intake.

Exposure routes and human receptor groups were identified and quantitative estimates of the magnitude, frequency, and duration of exposure were made. Exposure points were estimated using the 95 percent UCL calculation. Chronic daily intakes for the ingestion, and dermal contact routes were calculated for the reasonable maximum exposure (i.e., using 95 percent UCL concentrations and the 90<sup>th</sup> and 95<sup>th</sup> percentile exposure parameters).

In the toxicity assessment, current toxicological human health data (i.e., reference doses, reference concentrations, and slope factors) were obtained from various sources and were utilized in the order as specified by RAGS (USEPA, 1989a). Toxicological profiles for the chemicals of potential concern have been developed and are presented in Appendix E.

Risk characterization involved integrating the exposure and toxicity assessments into quantitative expressions of risks/health effects. Specifically, chronic daily intakes are multiplied by the cancer slope factors to estimate potential risk since only the hazard index is calculated by comparison. The carcinogenic risks and noncarcinogenic hazard index values calculated for the site are based on the reasonable maximum exposure (the highest exposure reasonably expected to occur at a site). The intent is to estimate a conservative exposure case that is still within the range of possible exposures.

In accordance with the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) Section 300.430 (e)(2) for known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper-bound lifetime cancer risk to an individual of between  $10^{-4}$  and  $10^{-6}$ . Per RAGS Part B: Development of Risk-Based Preliminary Remediation Goals (USEPA, 1991b), for noncarcinogenic effects, the NCP does not specify a range, but it is generally appropriate to assume a hazard index equal to 1.

In general, the USEPA recommends target values or ranges (i.e., risk of  $10^{-4}$  to  $10^{-6}$  or hazard index of one) as threshold values for potential human health impacts (USEPA, 1989a). These target values

aid in determining the objectives of the baseline human health risk assessment which include determining whether additional response action is necessary at the site, by providing a basis for determining residual chemical levels that are adequately protective of human health, by providing a basis for comparing potential health impacts of various remedial alternatives, and to help support selection of the "no action" remedial alternative, where appropriate.

In summary, a review of the overall carcinogenic risks and noncarcinogenic hazards for the various AOCs, matrices, and receptor populations showed a number of exceedances of the USEPA's target risk range of  $10^{-4}$  to  $10^{-6}$ .

Site-specific uncertainties relating to the risk assessment were qualitatively addressed in Section 6.0. In accordance with standard risk assessment practice, central tendency calculations were performed as a quantitative measure of uncertainty in the risk assessment. The 50<sup>th</sup> percentile parameters to be used in these calculations and presented in Standard Table 4 were assumed to be representative of the general population. These central tendency calculations, however, have the potential to underestimate true risks/hazard indices for sensitive receptors.

Finally, risk-based PRGs were calculated for industrial land use for COCs with risks greater than  $1.0E-04$  and hazard indices greater than 1. Risk-based PRGs are initial guidelines only and do not establish that cleanup to these goals is required. A risk-based concentration is considered a final remediation level only after analysis in the RI/FS and ROD.





## 9.0 REFERENCES

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## **STANDARD TABLES**

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Soil	Surface Soil	Atlantic Development Corp. Horseshoe Road Drum Dump Sayreville Pesticide Dump Atlantic Resources Corp.	Area Residents (Trespassers)	Youth	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	Quant Quant* Qual**	The site is not currently used for industry. The facility has some minor institutional controls to prevent entry to the site, however entry has occurred as evidenced by vandalism.
				Residents	Adult & Child	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	None None None	At present, the site does not serve as a residential property.
				Site Workers	Adult	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	None None None	The site's industrial operations have been abandoned. Therefore, there are no site workers currently at the site.
				Construction Workers	Adult	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	None None None	Construction work involving excavation activity is not currently in progress at the site.

400170

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Soil	Subsurface Soil	Atlantic Development Corp. Horseshoe Road Drum Dump Sayreville Pesticide Dump Atlantic Resources Corp.	Area Residents (Trespassers)	Youth	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	None None None	Construction work involving excavation activity is not currently in progress at the site. Therefore, no subsurface soil is accessible for contact.
				Residents	Adult & Child	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	None None None	Construction work involving excavation activity is not currently in progress at the site. Therefore, no subsurface soil is accessible for contact.
				Site Workers	Adult	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	None None None	Construction work involving excavation activity is not currently in progress at the site. Therefore, no subsurface soil is accessible for contact.
				Construction Workers	Adult	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	None None None	Construction work involving excavation activity is not currently in progress at the site. Therefore, no subsurface soil is accessible for contact.

400171

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Building Materials	Building Materials	Atlantic Development Corp. Atlantic Resources Corp.	Area Residents (Trespassers)	Adult & Child	Ingestion	On-Site	Quant	The site is not currently used for industry. The facility has some minor institutional controls to prevent entry to the site. However, entry has occurred as evidenced by vandalism.
						Dermal Contact		Quant*	
						Inhalation of Particulates		Qual**	
				Residents	Adult & Child	Ingestion	On-Site	None	At present, the site does not serve as a residential property.
						Dermal Contact		None	
						Inhalation of Particulates		None	
				Site Workers	Adult	Ingestion	On-Site	None	The site's industrial operations have been abandoned. Therefore, there are no site workers currently at the site.
						Dermal Contact		None	
						Inhalation of Particulates		None	
				Construction Workers	Adult	Ingestion	On-Site	None	Construction work involving excavation activity is not currently in progress at the site.
						Dermal Contact		None	
						Inhalation of Particulates		None	

400172

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Groundwater	Groundwater	Aquifer	Residents	Adult & Child	Ingestion	On-Site	None	At present, the site does not serve as a residential area. Groundwater from the site is not a potable source of drinking water for residents.
						Dermal Contact	& Off-Site	None	
						Inhalation of VOCs		None	
				Site Workers	Adult	Ingestion	On-Site	None	The site's industrial operations have been abandoned. Therefore, there are no site workers currently at the site.
						Dermal Contact		None	
						Inhalation of VOCs		None	
				Construction Workers	Adult	Ingestion	On-Site	None	Construction work is not currently in progress at the site.
						Dermal Contact		None	
						Inhalation of VOCs and Particulates		None	

400173



TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Water	Surface Water	Raritan River	Area Residents (Trespassers)	Youth	Ingestion	On-Site	Quant	Trespassers may incidentally ingest and dermally contact surface water in the Raritan River, drafting pond, drainage channels and wetlands. Exposure to VOCs released from surface water into ambient air will be qualitatively evaluated.
			Drafting Pond			Dermal Contact		Quant	
			Drainage Channels			Inhalation of VOCs		Qual**	
			Wetlands						
Current	Surface Water	Shellfish	Raritan River	Residents	Adult	Ingestion	Off-site	Quant	Residents may ingest shellfish caught in the Raritan River that have been potentially impacted by site contaminants released into surface water.
Current	Sediment	Sediment	Raritan River	Area Residents (Trespassers)	Youth	Ingestion	On-Site	Quant	Trespassers may incidentally ingest and dermally contact sediment in the Raritan River, drafting pond, drainage channels and wetlands. Exposure to particulates released from sediment into ambient air will be qualitatively evaluated.
			Drafting Pond			Dermal Contact		Quant*	
			Drainage Channels			Inhalation of		Qual**	
			Wetlands			Particulates			

400174

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Soil	Surface Soil	Atlantic Development Corp. Horseshoe Road Drum Dump Sayreville Pesticide Dump Atlantic Resources Corp.	Area Residents (Trespassers)	Youth	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	Quant Quant* Qual**	The site may be redeveloped for commercial/industrial uses. Trespassing by area residents may occur.
				Residents	Adult & Child	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	None None None	The site will remain as commercial/industrial in the future.
				Site Workers	Adult	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	Quant Quant* Qual**	The site may be redeveloped for commercial/industrial uses and workers may conduct activities in outside areas.
				Construction Workers	Adult	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	Quant Quant* Qual**	Future construction activities may occur on the site. Potential exposures are expected to be short-term (i.e., six months)

400175

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Soil	Subsurface Soil	Atlantic Development Corp. Horseshoe Road Drum Dump Sayreville Pesticide Dump Atlantic Resources Corp.	Area Residents (Trespassers)	Youth	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	Quant Quant* Qual**	The site may be redeveloped for commercial/industrial uses. Trespassing by area residents may occur. Exposure to subsurface soils may occur, if excavation activities are conducted.
				Residents	Adult & Child	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	None None None	The site will remain as commercial/industrial in the future.
				Site Workers	Adult	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	Quant Quant* Qual**	The site may be redeveloped for commercial/industrial uses and workers may be exposed to subsurface soils if excavation activities are conducted.
				Construction Workers	Adult	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	Quant Quant* Qual**	Future construction activities may occur on the site. Potential exposures to construction workers are expected to be short-term (i.e., six months).

400176

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Building Materials	Building Materials	Atlantic Development Corp. Atlantic Resources Corp.	Area Residents (Trespassers)	Youth	Ingestion Dermal Contact Inhalation of Particulates	On-Site	Quant Quant* Qual**	The site may be redeveloped for commercial/industrial uses. Trespassing by area residents may occur.
				Residents	Adult & Child	Ingestion Dermal Contact Inhalation of Particulates	On-Site	None None None	The site may be theoretically developed for residential purposes. However, it is assumed that the present buildings would not be used as residences.
				Site Workers	Adult	Ingestion Dermal Contact Inhalation of Particulates	On-Site	Quant Quant* Qual**	The site may be redeveloped for commercial/industrial uses and workers may be exposed to building materials, if the present buildings are used.
				Construction Workers	Adult	Ingestion Dermal Contact Inhalation of Particulates	On-Site	Quant Quant* Qual**	Construction work inside the present site buildings may occur.

400177

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Groundwater	Groundwater	Aquifer	Residents	Adult & Child	Ingestion Dermal Contact Inhalation of VOCs	On-Site & Off-Site	None None None	If the site is residentially developed in the future, it is not likely that water supply wells will be installed in the site's aquifer, since there is not sufficient yield in the aquifer to support a well.
				Site Workers	Adult	Ingestion Dermal Contact Inhalation of VOCs	On-Site	None None None	If the site is commercially/industrially developed in the future, it is not likely water supply wells will be installed in the site's aquifer, since there is not sufficient yield in the aquifer to support a well.
				Construction Workers	Adult	Ingestion Dermal Contact Inhalation of VOCs and Particulates	On-Site	None None None	If the site is commercially/industrially developed in the future, it is not likely water supply wells will be installed in the site's aquifer, since there is not sufficient yield in the aquifer to support a well.

400178

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Water	Surface Water	Raritan River	Area Residents (Trespassers)	Youth	Ingestion	On-Site	Quant	Trespassers may incidentally ingest and dermally contact surface water in the Raritan River, drafting pond, drainage channels and wetlands.
			Drafting Pond			Dermal Contact		Quant	
			Drainage Channels			Inhalation of VOCs		Qual**	Exposure to VOCs released from surface water into ambient air will be qualitatively evaluated.
			Wetlands	Residents	Adult & Child	Ingestion	On-Site	Quant	If it is possible that the areas along the Raritan River will be developed into a public area, including a boardwalk, park, and retail shops.
			Raritan River			Dermal Contact		Quant	
			Wetlands			Inhalation of VOCs		Qual**	Exposure to VOCs released from surface water into ambient air will be qualitatively evaluated.
Future	Surface Water	Shellfish	Raritan River	Residents	Adult	Ingestion	Off-site	Quant	Residents may ingest shellfish caught in the Raritan River that have been potentially impacted by site contaminants released into surface water.
Future	Sediment	Sediment	Raritan River	Area Residents (Trespassers)	Youth	Ingestion	On-Site	Quant	Trespassers may incidentally ingest and dermally contact sediment in the Raritan River, drafting pond, drainage channels and wetlands.
			Drafting Pond			Dermal Contact		Quant*	
			Drainage Channels			Inhalation of Particulates		Qual**	Exposure to particulates released from sediment into ambient air will be qualitatively evaluated.
			Wetlands	Residents	Adult & Child	Ingestion	On-Site	Quant	If it is possible that the areas along the Raritan River will be developed into a public area, including a boardwalk, park, and retail shops.
			Raritan River			Dermal Contact		Quant*	
			Wetlands			Inhalation of Particulates		Qual**	Exposure to particulates released from sediment into ambient air will be qualitatively evaluated.

\* The dermal contact pathway for soil and sediment at the site can only be quantitatively evaluated for arsenic, cadmium, chlordane, DDT, TCDD (dioxin), PAHs (benzo(a)pyrene, PCBs (Aroclor 1254 and 1242), pentachlorophenol, generic default SVOCs, and inorganics. Region II currently provided dermal absorption factors for these chemicals. All other chemicals will be qualitatively discussed.

\*\* The inhalation of VOCs and particulates pathways were eliminated from the risk assessment based on the results of the chemical concentration-toxicity screens performed for site media in the various areas of concern and the chemicals of potential concern selected. The majority of COCs were nonvolatiles (PAHs, pesticides, PCBs, and inorganics).

Scenario Timeframe:  
Medium:  
Exposure Medium:  
Exposure Point:

(1) Minimum/maximum detected concentration.

(2) N/A - Refer to supporting information for background discussion.

Background values derived from statistical analysis. Follow Regional guidance and provide supporting information.

(3) Provide reference for screening toxicity value.

(4) Rationale Codes      Selection Reason:      Infrequent Detection but Associated Historically (HIST)  
Frequent Detection (FD)  
Toxicity Information Available (TX)  
Above Screening Levels (ASL)  
Infrequent Detection (IFD)  
Background Levels (BKG)  
No Toxicity Information (NTX)  
Essential Nutrient (NUT)  
Below Screening Level (BSL)

+++++

Deletion Reason:

400180

TABLE 3.1  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 1 - HRDD

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Dieldrin	ug/kg	24	N/A (3)	120	NJ	ug/kg	120	Max	(1)	24	Mean-N	(2)
Aroclor-1248	ug/kg	1878	N/A (3)	9500	NJD	ug/kg	9500	Max	(1)	1878	Mean-N	(2)
Aroclor-1254	ug/kg	398	N/A (3)	850	J	ug/kg	850	Max	(1)	398	Mean-N	(2)
Aroclor-1260	ug/kg	207	N/A (3)	720	DJ	ug/kg	720	Max	(1)	207	Mean-N	(2)
Aluminum	mg/kg	7803	N/A (3)	14800		mg/kg	14250	95% UCL-T	(3)	6975	Mean-T	(3)
Antimony	mg/kg	2.1	N/A (3)	3.4	BNJ	mg/kg	3.4	Max	(1)	2.1	Mean-N	(2)
Arsenic	mg/kg	33	N/A (3)	68	*J	mg/kg	53	95% UCL-T	(3)	30	Mean-T	(3)
Cadmium	mg/kg	2.3	N/A (3)	4.5		mg/kg	4.5	Max	(1)	2.3	Mean-N	(2)
Copper	mg/kg	186	N/A (3)	433	*J	mg/kg	433	Max	(1)	186	Mean-N	(2)
Manganese	mg/kg	155	N/A (3)	420	NJ	mg/kg	420	Max	(1)	155	Mean-N	(2)
Nickel	mg/kg	44	N/A (3)	108		mg/kg	108	Max	(1)	44	Mean-N	(2)
Silver	mg/kg	16	N/A (3)	30		mg/kg	30	Max	(1)	16	Mean-N	(2)
Thallium	mg/kg	0.63	N/A (3)	1	B	mg/kg	1	Max	(1)	0.63	Mean-N	(2)
Vanadium	mg/kg	40	N/A (3)	78		mg/kg	64	95% UCL-T	(3)	37	Mean-T	(3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

(1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.

(3) Data assumed to be log normally distributed.

181004



TABLE 3.1  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 2 - ADC

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	ug/kg	4534	N/A (3)	21000	J	ug/kg	21000	Max	(1)	4534	Mean-N	(2)
Benzo(b)fluoranthene	ug/kg	7841	N/A (3)	30000		ug/kg	30000	Max	(1)	7841	Mean-N	(2)
Benzo(a)pyrene	ug/kg	5343	N/A (3)	20000	J	ug/kg	20000	Max	(1)	5343	Mean-N	(2)
Indeno(1,2,3-cd)pyrene	ug/kg	3251	N/A (3)	12000		ug/kg	12000	Max	(1)	3251	Mean-N	(2)
Dibenzo(a,h)anthracene	ug/kg	2532	N/A (3)	2300		ug/kg	2300	Max	(1)	2532	Mean-N	(2)
Aldrin	ug/kg	114	N/A (3)	400	NJ	ug/kg	400	Max	(1)	114	Mean-N	(2)
Dieldrin	ug/kg	200	N/A (3)	740	J	ug/kg	740	Max	(1)	200	Mean-N	(2)
Methoxychlor	ug/kg	72823	N/A (3)	980000	JD	ug/kg	980000	Max	(1)	72823	Mean-N	(2)
Aroclor-1248	ug/kg	7359	N/A (3)	34000	JD	ug/kg	34000	Max	(1)	7359	Mean-N	(2)
Aroclor-1260	ug/kg	1500	N/A (3)	2500	NJ	ug/kg	2500	Max	(1)	1500	Mean-N	(2)
2,3,7,8-TCDD equiv.	ug/kg	0.15	N/A (3)	0.308		ug/kg	0.308	Max	(1)	0.15	Mean-N	(2)
Antimony	mg/kg	10	N/A (3)	84.1	NJ	mg/kg	32	95% UCL-T	(3)	2.7	Mean-T	(3)
Arsenic	mg/kg	426	N/A (3)	3640		mg/kg	3640	95% UCL-T	(3)	46	Mean-T	(3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);  
Mean of Normal Data (Mean-N).

N/A - Not Applicable.

(1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.

(3) Data assumed to be log normally distributed.

400182

TABLE 3.1  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 3 - SPD

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	ug/kg	959	N/A (3)	7300	J	ug/kg	1701	95% UCL-T	(3)	388	Mean-T	(3)
Benzo(b)fluoranthene	ug/kg	998	N/A (3)	7700	J	ug/kg	2883	95% UCL-T	(3)	337	Mean-T	(3)
Benzo(a)pyrene	ug/kg	797	N/A (3)	6500	J	ug/kg	1468	95% UCL-T	(3)	324	Mean-T	(3)
Indeno(1,2,3-cd)pyrene	ug/kg	704	N/A (3)	4000	J	ug/kg	1302	95% UCL-T	(3)	369	Mean-T	(3)
Methoxychlor	ug/kg	50976	N/A (3)	650000	JD	ug/kg	650000	Max	(1)	50976	Mean-N	(2)
Aluminum	mg/kg	5036	N/A (3)	14200		mg/kg	8432	95% UCL-T	(3)	4024	Mean-T	(3)
Antimony	mg/kg	4.0	N/A (3)	23		mg/kg	17	95% UCL-T	(3)	1.6	Mean-T	(3)
Arsenic	mg/kg	13	N/A (3)	32		mg/kg	24	95% UCL-T	(3)	10	Mean-T	(3)
Copper	mg/kg	308	N/A (3)	2210		mg/kg	1519	95% UCL-T	(3)	86	Mean-T	(3)
Manganese	mg/kg	95	N/A (3)	326		mg/kg	215	95% UCL-T	(3)	58	Mean-T	(3)
Thallium	mg/kg	0.73	N/A (3)	1.3	B	mg/kg	0.92	95% UCL-T	(3)	0.68	Mean-T	(3)
Vanadium	mg/kg	30	N/A (3)	49		mg/kg	37	95% UCL-T	(3)	28	Mean-T	(3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

(1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.

(3) Data assumed to be log normally distributed.

400183

TABLE 3.1  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 4 - ARC

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(b)fluoranthene	ug/kg	1694	N/A (3)	2600		ug/kg	2600	Max	(1)	1694	Mean-N	(2)
Benzo(a)pyrene	ug/kg	1640	N/A (3)	1800	J	ug/kg	1800	Max	(1)	1640	Mean-N	(2)
Hexachlorobutadiene	ug/kg	1879	N/A (3)	6800	J	ug/kg	6800	Max	(1)	1879	Mean-N	(2)
Hexachlorocyclopentadiene	ug/kg	22720	N/A (3)	340000	JD	ug/kg	57440	95% UCL-T	(3)	846	Mean-T	(3)
Aldrin	ug/kg	37	N/A (3)	570	NJD	ug/kg	22	95% UCL-T	(3)	1.6	Mean-T	(3)
Aroclor-1248	ug/kg	937	N/A (3)	15000	JD	ug/kg	891	95% UCL-T	(3)	43	Mean-T	(3)
Aroclor-1254	ug/kg	753	N/A (3)	10000	ECJ	ug/kg	1941	95% UCL-T	(3)	62	Mean-T	(3)
Aroclor-1260	ug/kg	348	N/A (3)	5000	JD	ug/kg	465	95% UCL-T	(3)	44	Mean-T	(3)
2,3,7,8-TCDD equiv.	ug/kg	0.12	N/A (3)	0.20		ug/kg	0.2	Max	(1)	0.12	Mean-N	(2)
Aluminum	mg/kg	6918	N/A (3)	15500		mg/kg	15500	Max	(1)	6918	Mean-N	(2)
Antimony	mg/kg	6.5	N/A (3)	23		mg/kg	18	95% UCL-T	(3)	3.5	Mean-T	(3)
Arsenic	mg/kg	12	N/A (3)	30		mg/kg	27	95% UCL-T	(3)	9.7	Mean-T	(3)
Cadmium	mg/kg	8.4	N/A (3)	103		mg/kg	37	95% UCL-T	(3)	1.3	Mean-T	(3)
Copper	mg/kg	174	N/A (3)	591		mg/kg	591	Max	(1)	174	Mean-N	(2)
Manganese	mg/kg	123	N/A (3)	461		mg/kg	461	Max	(1)	123	Mean-N	(2)
Nickel	mg/kg	62	N/A (3)	507	J	mg/kg	298	95% UCL-T	(3)	21	Mean-T	(3)
Silver	mg/kg	66	N/A (3)	287	NJ	mg/kg	287	Max	(1)	66	Mean-N	(2)
Thallium	mg/kg	0.59	N/A (3)	1.7	B	mg/kg	0.72	95% UCL-T	(3)	0.53	Mean-T	(3)
Zinc	mg/kg	2016	N/A (3)	31400	N*EJ	mg/kg	9172	95% UCL-T	(3)	108	Mean-T	(3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);  
Mean of Normal Data (Mean-N).

N/A - Not Applicable.

(1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.

(3) Data assumed to be log normally distributed.

**TABLE 3.2**  
**MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: AOC 1 - HRDD

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Aroclor-1248	ug/kg	341	N/A (3)	1300	D	ug/kg	1300	Max	(1)	341	Mean-N	(2)
Aroclor-1254	ug/kg	40	N/A (3)	98		ug/kg	98	Max	(1)	40	Mean-N	(2)
Aroclor-1260	ug/kg	787	N/A (3)	3100	D	ug/kg	3100	Max	(1)	787	Mean-N	(2)
Aluminum	mg/kg	8282	N/A (3)	11800	*	mg/kg	10685	95% UCL-T	(3)	8056	Mean-T	(3)
Antimony	mg/kg	1.5	N/A (3)	5.1	BNJ	mg/kg	5.1	Max	(1)	1.5	Mean-N	(2)
Arsenic	mg/kg	14.7	N/A (3)	27.1		mg/kg	24.5	95% UCL-T	(3)	13.5	Mean-T	(3)
Cadmium	mg/kg	2.1	N/A (3)	5.1		mg/kg	4.4	95% UCL-T	(3)	1.8	Mean-T	(3)
Copper	mg/kg	402	N/A (3)	1222		mg/kg	1222	Max	(1)	402	Mean-N	(2)
Manganese	mg/kg	244	N/A (3)	486	*	mg/kg	486	Max	(1)	244	Mean-N	(2)
Nickel	mg/kg	50	N/A (3)	174		mg/kg	174	Max	(1)	50	Mean-N	(2)
Thallium	mg/kg	0.93	N/A (3)	2.5		mg/kg	2.5	Max	(1)	0.93	Mean-N	(2)
Vanadium	mg/kg	38.3	N/A (3)	50		mg/kg	50	Max	(1)	38.3	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.  
(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.  
(3) Data assumed to be log normally distributed.

TABLE 3.2  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Test Pit Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC1 - HRDD-TP

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	ug/kg	517	N/A (3)	3300	J	ug/kg	1348	95% UCL-T	(3)	184	Mean-T	(3)
Aroclor-1248	ug/kg	3882	N/A (3)	41000		ug/kg	41000	Max	(1)	3882	Mean-N	(2)
Aroclor-1254	ug/kg	1105	N/A (3)	6200		ug/kg	6200	Max	(1)	1105	Mean-N	(2)
Antimony	mg/kg	150	N/A (3)	2000		mg/kg	1308	95% UCL-T	(3)	3.2	Mean-T	(3)
Arsenic	mg/kg	108	N/A (3)	853	NJ	mg/kg	707	95% UCL-T	(3)	33	Mean-T	(3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.  
(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.  
(3) Data assumed to be log normally distributed.

400186

TABLE 3.2  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Subsurface Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 2 - ADC

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
1,2-Dichloroethene	ug/kg	26703	N/A (3)	390000	D	ug/kg	390000	Max	(1)	26703	Mean-N	(2)
Benzo(b)fluoranthene	ug/kg	2128	N/A (3)	30000	J	ug/kg	3149	95% UCL-T	(3)	490	Mean-T	(3)
Benzo(a)pyrene	ug/kg	2143	N/A (3)	26000	J	ug/kg	4713	95% UCL-T	(3)	563	Mean-T	(3)
Methoxychlor	ug/kg	64833	N/A (3)	760000	JD	ug/kg	760000	Max	(1)	64833	Mean-N	(2)
Aroclor-1242	ug/kg	2610	N/A (3)	17000	JD	ug/kg	10538	95% UCL-T	(3)	76.8	Mean-T	(3)
Aroclor-1248	ug/kg	7261	N/A (3)	74000	J	ug/kg	74000	Max	(1)	7261	Mean-N	(2)
Arsenic	mg/kg	130	N/A (3)	1120	J	mg/kg	828	95% UCL-T	(3)	21	Mean-T	(3)
Thallium	mg/kg	1.3	N/A (3)	3.5	BJ	mg/kg	1.8	95% UCL-T	(3)	1.0	Mean-T	(3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.  
(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.  
(3) Data assumed to be log normally distributed.

400187

TABLE 3.2  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Subsurface Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 3 - SPD

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	ug/kg	341	N/A (3)	93	J	ug/kg	93	Max	(1)	93	Max	(4)
Aroclor-1254	ug/kg	77	N/A (3)	450		ug/kg	164	95% UCL-T	(3)	36	Mean-T	(3)
Aroclor-1260	ug/kg	78	N/A (3)	400		ug/kg	178	95% UCL-T	(3)	36	Mean-T	(3)
Methoxychlor	ug/kg	2241	N/A (3)	18000	JD	ug/kg	18000	Max	(1)	2241	Mean-N	(2)
Aluminum	mg/kg	5287	N/A (3)	16400	J	mg/kg	9082	95% UCL-T	(3)	4106	Mean-T	(3)
Antimony	mg/kg	0.62	N/A (3)	1.9	B	mg/kg	0.83	95% UCL-T	(3)	0.54	Mean-T	(3)
Arsenic	mg/kg	8.6	N/A (3)	33.6	NJ	mg/kg	29	95% UCL-T	(3)	5.0	Mean-T	(3)
Cadmium	mg/kg	0.4	N/A (3)	1.5		mg/kg	0.67	95% UCL-T	(3)	0.22	Mean-T	(3)
Manganese	mg/kg	63	N/A (3)	435	*	mg/kg	197	95% UCL-T	(3)	23	Mean-T	(3)
Thallium	mg/kg	0.8	N/A (3)	2.8		mg/kg	1.2	95% UCL-T	(3)	0.65	Mean-T	(3)
Vanadium	mg/kg	25.1	N/A (3)	50.3		mg/kg	33	95% UCL-T	(3)	23	Mean-T	(3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);  
Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
- (2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.
- (3) Data assumed to be log normally distributed.
- (4) Mean concentration exceeds the maximum concentration, due to high detection limits for nondetects.

881006

**TABLE 3.2**  
**MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Scenario Timeframe: Future
Medium: Test Pit Soil
Exposure Medium: Test Pit Soil
Exposure Point: AOC 3 - SPD-TP

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Hexachloroethane	ug/kg	1300000	N/A (3)	25000000	JD	ug/kg	10201148	95% UCL-T	(3)	1751	Mean-T	(3)
Benzo(a)pyrene	ug/kg	2000	N/A (3)	4700	J	ug/kg	4700	Max	(1)	2000	Mean-N	(2)
Dibenzo(a,h)anthracene	ug/kg	1794	N/A (3)	920	J	ug/kg	920	Max	(1)	920	Max	(4)
Aroclor-1248	ug/kg	3331	N/A (3)	21000		ug/kg	21000	Max	(1)	3331	Mean-N	(2)
Aroclor-1254	ug/kg	784	N/A (3)	8000	J	ug/kg	8000	Max	(1)	784	Mean-N	(2)
Arsenic	mg/kg	21.5	N/A (3)	77.2	*EJ	mg/kg	77.2	Max	(1)	21.5	Mean-N	(2)
Copper	mg/kg	3502	N/A (3)	32300	*EJ	mg/kg	32300	Max	(1)	3502	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
- (2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.
- (3) Data assumed to be log normally distributed.
- (4) Mean concentration exceeds the maximum concentration, due to high detection limits for nondetects.

400189



**TABLE 3.2**  
**MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: AOC 4 - ARC

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Tetrachloroethene	ug/kg	1434	N/A (3)	23000		ug/kg	19252	95% UCL-T	(3)	28.9	Mean-T	(3)
Chlorobenzene	ug/kg	4593	N/A (3)	80000		ug/kg	29736	95% UCL-T	(3)	35	Mean-T	(3)
Benzo(a)anthracene	ug/kg	521	N/A (3)	2250	J	ug/kg	793	95% UCL-T	(3)	351	Mean-T	(3)
Benzo(b)fluoranthene	ug/kg	556	N/A (3)	2550	J	ug/kg	830	95% UCL-T	(3)	380	Mean-T	(3)
Benzo(a)pyrene	ug/kg	523	N/A (3)	1950	J	ug/kg	767	95% UCL-T	(3)	374	Mean-T	(3)
Indeno(1,2,3-cd)pyrene	ug/kg	478	N/A (3)	1150	J	ug/kg	693	95% UCL-T	(3)	363	Mean-T	(3)
1,2,4-Trichlorobenzene	ug/kg	35440	N/A (3)	800000	JD	ug/kg	112687	95% UCL-T	(3)	632	Mean-T	(3)
Aldrin	ug/kg	5	N/A (3)	53	NJD	ug/kg	5.7	95% UCL-T	(3)	1.6	Mean-T	(3)
Aroclor-1248	ug/kg	128	N/A (3)	1600	JD	ug/kg	149	95% UCL-T	(3)	34	Mean-T	(3)
Aroclor-1254	ug/kg	42	N/A (3)	130	J	ug/kg	56	95% UCL-T	(3)	28	Mean-T	(3)
Aluminum	mg/kg	8615	N/A (3)	20200		mg/kg	13018	95% UCL-T	(3)	7140	Mean-T	(3)
Antimony	mg/kg	1.4	N/A (3)	3.4	B	mg/kg	2.1	95% UCL-T	(3)	1.1	Mean-T	(3)
Arsenic	mg/kg	9.3	N/A (3)	18.5		mg/kg	13.0	95% UCL-T	(3)	7.8	Mean-T	(3)
Manganese	mg/kg	70	N/A (3)	183	NJ	mg/kg	133	95% UCL-T	(3)	46	Mean-T	(3)
Thallium	mg/kg	0.82	N/A (3)	2.2	B	mg/kg	1.1	95% UCL-T	(3)	0.82	Mean-T	(3)
Vanadium	mg/kg	34.7	N/A (3)	53.9		mg/kg	43	95% UCL-T	(3)	32	Mean-T	(3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);  
Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
- (2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.
- (3) Data assumed to be log normally distributed.

061007

**TABLE 3.3**  
**MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 1 - HRDD

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Vinyl Chloride	ug/l	5	N/A (3)	4	J	ug/l	4	Max	(1)	4	Max	(4)
Antimony	ug/l	8	N/A (3)	10	B	ug/l	10	Max	(1)	8	Mean-N	(2)
Arsenic	ug/l	46	N/A (3)	89.6		ug/l	89.6	Max	(1)	46	Mean-N	(2)
Cadmium	ug/l	6	N/A (3)	8.5		ug/l	8.5	Max	(1)	6.1	Mean-N	(2)
Copper	ug/l	780	N/A (3)	1230	EJ	ug/l	1230	Max	(1)	780	Mean-N	(2)
Manganese	ug/l	880	N/A (3)	1030	EJ	ug/l	1030	Max	(1)	880	Mean-N	(2)
Nickel	ug/l	136	N/A (3)	144		ug/l	144	Max	(1)	136	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
- (2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.
- (3) Data assumed to be log normally distributed.
- (4) Mean concentration exceeds the maximum concentration, due to high detection limits for nondetects.

400191

TABLE 3.3  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 2 - ADC

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Vinyl Chloride	ug/l	7.8	N/A (3)	36		ug/l	9.8	95% UCL-T	(3)	5.9	Mean-T	(3)
Antimony	ug/l	6.1	N/A (3)	34.5	JB	ug/l	9.6	95% UCL-T	(3)	3.7	Mean-T	(3)
Arsenic	ug/l	83	N/A (3)	467	NJ	ug/l	467	Max	(1)	83	Mean-N	(2)
Manganese	ug/l	320	N/A (3)	919	J	ug/l	673	95% UCL-T	(3)	245	Mean-T	(3)
Thallium	ug/l	1.9	N/A (3)	3.9	JB	ug/l	2.3	95% UCL-T	(3)	1.8	Mean-T	(3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);  
Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
- (2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.
- (3) Data assumed to be log normally distributed.

400192

**TABLE 3.3**  
**MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 3 - SPD

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Methoxychlor	ug/l	0.63	N/A (3)	0.91	J	ug/l	0.91	Max	(1)	0.63	Mean-N	(2)
Aluminum	ug/l	1311	N/A (3)	2610		ug/l	2610	Max	(1)	1311	Mean-N	(2)
Arsenic	ug/l	6.2	N/A (3)	9.9	JB	ug/l	9.9	Max	(1)	6.2	Mean-N	(2)
Copper	ug/l	120	N/A (3)	247	EJ	ug/l	247	Max	(1)	120	Mean-N	(2)
Manganese	ug/l	661	N/A (3)	919	J	ug/l	919	Max	(1)	661	Mean-N	(2)
Vanadium	ug/l	4.9	N/A (3)	7.4	B	ug/l	7.4	Max	(1)	4.9	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);  
Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.  
(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.  
(3) Data assumed to be log normally distributed.

400193

TABLE 3.3  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 4 - ARC

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Antimony	ug/l	16	N/A (3)	94	NJ	ug/l	92	95% UCL-T	(3)	6.2	Mean-T	(3)
Arsenic	ug/l	6.0	N/A (3)	18		ug/l	13	95% UCL-T	(3)	4.5	Mean-T	(3)
Cadmium	ug/l	3.2	N/A (3)	8.5		ug/l	8.5	Max	(1)	3.2	Mean-N	(2)
Copper	ug/l	286	N/A (3)	1230	EJ	ug/l	1230	Max	(1)	286	Mean-N	(2)
Manganese	ug/l	239	N/A (3)	730	J	ug/l	730	Max	(1)	239	Mean-N	(2)
Nickel	ug/l	37	N/A (3)	128		ug/l	128	Max	(1)	37	Mean-N	(2)
Silver	ug/l	11	N/A (3)	51		ug/l	38	95% UCL-T	(3)	6.7	Mean-T	(3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

(1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.

(3) Data assumed to be log normally distributed.

TABLE 3.3  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 5 - DSM

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Arsenic	ug/l	552	N/A (3)	569	EJ	ug/l	569	Max	(1)	552	Mean-N	(2)
Manganese	ug/l	1170	N/A (3)	1190		ug/l	1190	Max	(1)	1170	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);  
Mean of Normal Data (Mean-N).

N/A - Not Applicable.

(1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.

(3) Data assumed to be log normally distributed.

400195

**TABLE 3.3**  
**MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Scenario Timeframe: Current and Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: AOC 6 - RR

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Aluminum	ug/l	956	N/A (3)	2310	J	ug/l	2310	Max	(1)	956	Mean-N	(2)
Antimony	ug/l	3.5	N/A (3)	5.7	B	ug/l	5.7	Max	(1)	3.5	Mean-N	(2)
Arsenic	ug/l	11	N/A (3)	20		ug/l	20	Max	(1)	11	Mean-N	(2)
Copper	ug/l	165	N/A (3)	249	EJ	ug/l	249	Max	(1)	165	Mean-N	(2)
Manganese	ug/l	87	N/A (3)	101	EJ	ug/l	101	Max	(1)	87	Mean-N	(2)
Thallium	ug/l	2.7	N/A (3)	5	B	ug/l	5	Max	(1)	2.7	Mean-N	(2)
Vanadium	ug/l	7.7	N/A (3)	18.6	B	ug/l	18.6	Max	(1)	7.7	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
- (2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.
- (3) Data assumed to be log normally distributed.

TABLE 3.4  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 1 - HRDD

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	ug/kg	190	N/A (3)	61	J	ug/kg	61	Max	(1)	61	Max	(4)
Benzo(b)fluoranthene	ug/kg	163	N/A (3)	140	JX	ug/kg	140	Max	(1)	140	Max	(4)
Benzo(a)pyrene	ug/kg	173	N/A (3)	71	J	ug/kg	71	Max	(1)	71	Max	(4)
Indeno(1,2,3-cd)pyrene	ug/kg	214	N/A (3)	64	J	ug/kg	64	Max	(1)	64	Max	(4)
Aroclor-1254	ug/kg	103	N/A (3)	300	J	ug/kg	300	Max	(1)	103	Mean-N	(2)
Antimony	mg/kg	7.5	N/A (3)	21.4	BNJ	mg/kg	21.4	Max	(1)	7.5	Mean-N	(2)
Arsenic	mg/kg	309	N/A (3)	1110	NJ	mg/kg	1110	Max	(1)	309	Mean-N	(2)
Copper	mg/kg	1215	N/A (3)	5300		mg/kg	5300	Max	(1)	1215	Mean-N	(2)
Manganese	mg/kg	817	N/A (3)	2080		mg/kg	2080	Max	(1)	817	Mean-N	(2)
Thallium	mg/kg	1.2	N/A (3)	3.3	BJ	mg/kg	3.3	Max	(1)	3.2	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);  
Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.  
(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.  
(3) Data assumed to be log normally distributed.  
(4) Mean concentration exceeds the maximum concentration, due to high detection limits for nondetects.

400197



**TABLE 3.4**  
**MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 2 - ADC

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(e)pyrene	ug/kg	1241	N/A (3)	10000	J	ug/kg	6002	95% UCL-T	(3)	395	Mean-T	(3)
Methoxychlor	ug/kg	56556	N/A (3)	640000	JD	ug/kg	640000	Max	(1)	56556	Mean-N	(2)
Arsenic	mg/kg	689	N/A (3)	3480	NJ	mg/kg	3480	Max	(1)	689	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);  
Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.  
(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.  
(3) Data assumed to be log normally distributed.

400198

**TABLE 3.4**  
**MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Scenario Timeframe: Current and Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: AOC 3 - SPD

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(b)fluoranthene	ug/kg	497	N/A (3)	910	JX	ug/kg	910	Max	(1)	497	Mean-N	(2)
Benzo(a)pyrene	ug/kg	350	N/A (3)	630	J	ug/kg	630	Max	(1)	350	Mean-N	(2)
Dibenzo(a,h)anthracene	ug/kg	240	N/A (3)	130	J	ug/kg	130	Max	(1)	130	Max	(4)
Arochlor 1254	ug/kg	953	N/A (3)	68	D	ug/kg	68	Max	(1)	68	Max	(4)
Heptachlor	ug/kg	79	N/A (3)	220	J	ug/kg	220	Max	(1)	79	Mean-N	(2)
Methoxychlor	ug/kg	56567	N/A (3)	130000	D	ug/kg	130000	Max	(1)	56537	Mean-N	(2)
Aluminum	mg/kg	9643	N/A (3)	13600	EJ	mg/kg	13600	Max	(1)	9643	Mean-N	(2)
Antimony	mg/kg	1.3	N/A (3)	2.3	BNJ	mg/kg	2.3	Max	(1)	1.3	Mean-N	(2)
Arsenic	mg/kg	13.7	N/A (3)	21.8		mg/kg	21.8	Max	(1)	13.7	Mean-N	(2)
Copper	mg/kg	334	N/A (3)	816		mg/kg	816	Max	(1)	334	Mean-N	(2)
Manganese	mg/kg	154	N/A (3)	282		mg/kg	282	Max	(1)	154	Mean-N	(2)
Vanadium	mg/kg	42	N/A (3)	47.9	B	mg/kg	47.9	Max	(1)	42	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
- (2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.
- (3) Data assumed to be log normally distributed.
- (4) Mean concentration exceeds the maximum concentration, due to high detection limits for nondetects.

661007

**TABLE 3.4**  
**MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 4 - ARC

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Medium Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	ug/kg	711	N/A (3)	1000	NJ	ug/kg	1000	Max	(1)	711	Mean-N	(2)
Dieldrin	ug/kg	20	N/A (3)	180		ug/kg	41	95% UCL-T	(3)	4.2	Mean-T	(3)
Aroclor-1248	ug/kg	303	N/A (3)	2100		ug/kg	2100	Max	(1)	303	Mean-N	(2)
Aroclor-1254	ug/kg	5003	N/A (3)	57500	D	ug/kg	57500	Max	(1)	5003	Mean-N	(2)
Aroclor-1260	ug/kg	254	N/A (3)	2100	JD	ug/kg	2100	Max	(1)	254	Mean-N	(2)
2,3,7,8-TCDD equiv.	ug/kg	0.04	N/A (3)	0.08	J	ug/kg	0.08	Max	(1)	0.04	Mean-N	(2)
Antimony	mg/kg	6.4	N/A (3)	26	NJ	mg/kg	26	Max	(1)	6.4	Mean-N	(2)
Arsenic	mg/kg	20	N/A (3)	49	N	mg/kg	49	Max	(1)	20	Mean-N	(2)
Copper	mg/kg	411	N/A (3)	2350		mg/kg	1493	95% UCL-T	(3)	202	Mean-T	(3)
Silver	mg/kg	52	N/A (3)	321		mg/kg	321	Max	(1)	52	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

(1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.

(3) Data assumed to be log normally distributed.

400200

**TABLE 3.4**  
**MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 5 - DSM

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	ug/kg	450	N/A (3)	300	J	ug/kg	300	Max	(1)	300	Max	(4)
Benzo(b)fluoranthene	ug/kg	407	N/A (3)	730	JX	ug/kg	730	Max	(1)	407	Mean-N	(2)
Benzo(a)pyrene	ug/kg	460	N/A (3)	300	J	ug/kg	300	Max	(1)	300	Max	(4)
Indeno(1,2,3-cd)pyrene	ug/kg	437	N/A (3)	220	J	ug/kg	220	Max	(1)	220	Max	(4)
Aroclor-1254	ug/kg	387	N/A (3)	470	J	ug/kg	470	Max	(1)	387	Mean-N	(2)
Arsenic	mg/kg	1917	N/A (3)	4030	NJ	mg/kg	4030	Max	(1)	1917	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
- (2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.
- (3) Data assumed to be log normally distributed.
- (4) Mean concentration exceeds the maximum concentration, due to high detection limits for nondetects.

400201

**TABLE 3.4**  
**MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Scenario Timeframe: Current and Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: AOC 6 - RR

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Arsenic Copper	mg/kg	450	N/A (3)	2200	J	mg/kg	2200	Max	(1)	450	Mean-N	(2)
	mg/kg	1573	N/A (3)	3560	*J	mg/kg	3560	Max	(1)	1573	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

N/A - Not Applicable.

- (1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.  
(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.  
(3) Data assumed to be log normally distributed.

400202

TABLE 3.5  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	ug/kg	468143	N/A (3)	1100000	EJ	ug/kg	1100000	Max	(1)	468143	Mean-N	(2)
Benzo(b)fluoranthene	ug/kg	540875	N/A (3)	1400000	E	ug/kg	1400000	Max	(1)	540875	Mean-N	(2)
Benzo(a)pyrene	ug/kg	426620	N/A (3)	1100000	E	ug/kg	1100000	Max	(1)	426620	Mean-N	(2)
Indeno(1,2,3-cd)pyrene	ug/kg	147910	N/A (3)	300000	J	ug/kg	300000	Max	(1)	147910	Mean-N	(2)
Dibenzo(a,h)anthracene	ug/kg	42438	N/A (3)	90000	J	ug/kg	90000	Max	(1)	42438	Mean-N	(2)
Naphthalene	ug/kg	100988	N/A (3)	320000		ug/kg	320000	Max	(1)	100988	Mean-N	(2)
2-Methylnaphthalene	ug/kg	498113	N/A (3)	1100000		ug/kg	1100000	Max	(1)	498113	Mean-N	(2)
Acenaphthene	ug/kg	355888	N/A (3)	800000	E	ug/kg	800000	Max	(1)	355888	Mean-N	(2)
Dibenzofuran	ug/kg	398113	N/A (3)	1000000	ED	ug/kg	1000000	Max	(1)	398113	Mean-N	(2)
Fluorene	ug/kg	583363	N/A (3)	1600000	E	ug/kg	1600000	Max	(1)	583363	Mean-N	(2)
Fluoranthene	ug/kg	1833535	N/A (3)	3900000	JD	ug/kg	3900000	Max	(1)	1833525	Mean-N	(2)
Pyrene	ug/kg	1411478	N/A (3)	2800000	JD	ug/kg	2800000	Max	(1)	1411478	Mean-N	(2)
Methoxychlor	ug/kg	37714	N/A (3)	150000	D	ug/kg	150000	Max	(1)	37714	Mean-N	(2)
Antimony	mg/kg	3.7	N/A (3)	5.7	BNJ	mg/kg	5.7	Max	(1)	3.7	Mean-N	(2)
Arsenic	mg/kg	46	N/A (3)	84	*EJ	mg/kg	84	Max	(1)	46	Mean-N	(2)
Copper	mg/kg	253	N/A (3)	495	*	mg/kg	495	Max	(1)	253	Mean-N	(2)
Manganese	mg/kg	239	N/A (3)	495		mg/kg	495	Max	(1)	239	Mean-N	(2)
Thallium	mg/kg	0.9	N/A (3)	1.8	B	mg/kg	1.8	Max	(1)	0.9	Mean-N	(2)
Zinc	mg/kg	981	N/A (3)	3050	*	mg/kg	3050	Max	(1)	981	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);  
Mean of Normal Data (Mean-N).

N/A - Not Applicable

(1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC.

(3) Data assumed to be log normally distributed.

TABLE 3.5  
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 4 - ARC

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure:			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Aroclor-1254	ug/kg	5599	N/A (3)	30000	JD	ug/kg	30000	Max	(1)	5599	Mean-N	(2)
2,3,7,8-TCDD equiv.	ug/kg	3.2	N/A (3)	17		ug/kg	17	Max	(1)	3.2	Mean-N	(2)
Antimony	mg/kg	9017	N/A (3)	31700	NJ	mg/kg	31700	Max	(1)	9017	Mean-N	(2)
Arsenic	mg/kg	155	N/A (3)	254	*EJ	mg/kg	254	Max	(1)	155	Mean-N	(2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);  
Mean of Normal Data (Mean-N)

N/A - Not Applicable

(1) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC

(2) 95% UCL exceeds maximum detected concentration. Therefore, arithmetic average concentration used for EPC

(3) Data assumed to be log normally distributed

400204

TABLE 4.1  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: ADC, HRRD, SPD, and ARC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = $CS \times IR \times FI \times EF \times ED \times CF1 \times 1/BW \times 1/AT$
	IR	Ingestion rate	mg/day	100	RAGS, Part A	50	Region II	RME
	FI	Fraction ingested	unitless	1	RAGS, Part A			$CDI = CS \times 8.0E-08$ (Noncarcinogenic)
	EF	Exposure Frequency	days/yr	12	Site-specific**			$CDI = CS \times 5.1E-09$ (Carcinogenic)
	ED	Exposure Duration	yrs	6	RAGS, Part A			CI
	CF1	Conversion factor	kg/mg	10-6	-			$CDI = CS \times 3.0E-08$ (Noncarcinogenic)
	BW	Body Weight	kg	55	RAGS, Part A			$CDI = CS \times 2.6E-09$ (Carcinogenic)
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
Dermal	CS	Chemical Concentration in Soil	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = $CS \times SA \times AF \times ABS \times EF \times ED \times CF1 \times 1/BW \times 1/AT$
	SA	Skin surface area available for contact	cm <sup>2</sup> /event	2,535	EFH, 1997			RME
	AF	Soil-to-skin adherence factor	mg/cm <sup>2</sup>	1	DEA, 1992			$CDI = CS \times 1.5E-06 \times ABS$ (Noncarcinogenic)
	ABS	Absorption factor	unitless	Chem.-specific****	Region II			$CDI = CS \times 1.3E-07 \times ABS$ (Carcinogenic)
	EF	Exposure Frequency	events/yr	12	Site-specific**			CI
	ED	Exposure Duration	yrs	6	RAGS, Part A			$CDI = CS \times 1.5E-06 \times ABS$ (Noncarcinogenic)
	CF1	Conversion factor	kg/mg	10-6	-			$CDI = CS \times 1.3E-07 \times ABS$ (Carcinogenic)
	BW	Body Weight	kg	55	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

400205



TABLE 4.2  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: ADC and ARC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CBM	Chemical Concentration in Building Materials	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CBM x IR x FI x EF x ED x CF1 x 1/BW x 1/AT
	IR	Ingestion rate	mg/day	100	RAGS, Part A	50	Region II	RME
	FI	Fraction Ingested	unitless	1	RAGS, Part A			CDI = CBM x 6.0E-08 (Noncarcinogenic)
	EF	Exposure Frequency	days/yr	12	Site-specific**			CDI = CBM x 5.1E-09 (Carcinogenic)
	ED	Exposure Duration	yrs	6	RAGS, Part A			CI
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CBM x 3.0E-08 (Noncarcinogenic)
	BW	Body Weight	kg	55	RAGS, Part A			CDI = CBM x 2.6E-09 (Carcinogenic)
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
Dermal	CBM	Chemical Concentration in Building Materials	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CBM x SA x AF x ABS x EF x ED x CF x 1/BW x 1/AT
	SA	Skin surface area available for contact	cm2/event	2,535	EFH, 1997			RME
	AF	Soil-to-skin adherence factor	mg/cm2	1	DEA, 1992			CDI = CBM x 1.5E-06 x ABS (Noncarcinogenic)
	ABS	Absorption factor	unitless	Chem.-specific****	Region II			CDI = CBM x 1.3E-07 x ABS (Carcinogenic)
	EF	Exposure Frequency	events/yr	12	Site-specific**			CI
	ED	Exposure Duration	yrs	6	RAGS, Part A			CDI = CBM x 1.5E-06 x ABS (Noncarcinogenic)
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CBM x 1.3E-07 x ABS (Carcinogenic)
	BW	Body Weight	kg	55	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

400206

TABLE 4.3  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: HRDD, ADC, SPD, ARC, DSM, RR  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CSW	Chemical Concentration in Surface Water	mg/l	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = $CSW \times CR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	CR	Contact rate	l/hr	0.05	RAGS, Part A			RME
	ET	Exposure Time	hr/event	0.5	Site-specific**			CDI = $CSW \times 3.0E-05$ (Noncarinogenic)
	EF	Exposure Frequency	events/yr	24	Site-specific**			CDI = $CSW \times 2.6E-06$ (Carinogenic)
	ED	Exposure Duration	yrs	6	RAGS, Part A			CT
	BW	Body Weight	kg	55	RAGS, Part A			CDI = $CSW \times 3.0E-05$ (Noncarinogenic)
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			CDI = $CSW \times 2.6E-06$ (Carinogenic)
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
Dermal	CSW	Chemical Concentration in Surface Water	mg/l	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = $CSW \times SA \times PC \times ET \times EF \times ED \times CF \times 1/BW \times 1/AT$
	SA	Skin surface area available for contact	cm <sup>2</sup> /event	920	EFH, 1997			RME
	PC	Permeability Constant	cm/hr	Chem.-specific	DEA, 1992			CDI = $CSW \times 5.5E-04 \times PC$ (Noncarinogenic)
	ET	Exposure time	hrs/event	0.5	Site-specific**			CDI = $CSW \times 4.7E-05 \times PC$ (Carinogenic)
	EF	Exposure Frequency	events/yr	24	Site-specific**			CT
	ED	Exposure Duration	yrs	6	RAGS, Part A			CDI = $CSW \times 5.5E-04 \times PC$ (Noncarinogenic)
	CF1	Conversion factor	l/cm <sup>3</sup>	10-3	-			CDI = $CSW \times 4.7E-05 \times PC$ (Carinogenic)
	BW	Body Weight	kg	55	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

400207

TABLE 4.4  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Shellfish  
Exposure Point: Raritan River  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion of Shellfish	CSF	Chemical Concentration in Shellfish	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average		Chronic Daily Intake (CDI) (mg/kg/day) = CSF x IR x EF x ED x CF x 1/BW x 1/AT
	IR	Ingestion rate	kg/day	0.0085	RAGS, Part A			RME
	EF	Exposure Frequency	days/yr	350	RAGS, Part A			CDI = CSF x 8.9E-11 (Noncarcinogenic)
	ED	Exposure Duration	yrs	24	RAGS, Part A	9	RAGS, Part A	CDI = CSF x 3.1E-11 (Carcinogenic)
	CF	Conversion Factor	kg/mg	10-6	-			CT
	BW	Body Weight	kg	70	RAGS, Part A			CDI = CSF x 8.9E-11 (Noncarcinogenic)
	AT-NC	Averaging Time (noncancer)	days	8,760	RAGS, Part A	3,285		CDI = CSF x 1.2E-11 (Carcinogenic)
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

400208

TABLE 4.5  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: HRDD, ADC, SPD, SRC, DSM, RR  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CSE	Chemical Concentration in Sediment	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CSE x IR x FI x EF x ED x CF1 x 1/BW x 1/AT
	IR	Ingestion rate	mg/day	100	RAGS, Part A			RME
	FI	Fraction Ingested	unitless	1	RAGS, Part A			CDI = CSE x 1.2E-07 (Noncarcinogenic)
	EF	Exposure Frequency	days/yr	24	Site-specific**			CDI = CSE x 1.0E-08 (Carcinogenic)
	ED	Exposure Duration	yrs	6	RAGS, Part A			CT
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CSE x 1.2E-07 (Noncarcinogenic)
	BW	Body Weight	kg	55	RAGS, Part A			CDI = CSE x 1.0E-08 (Carcinogenic)
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
Dermal	CSE	Chemical Concentration in Sediment	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CSE x SA x AF x ABS x EF x ED x CF x 1/BW x 1/AT
	SA	Skin surface area available for contact	cm2/event	920	EFH, 1997			RME
	AF	Sediment-to-skin adherence factor	mg/cm2	1	DEA, 1992			CDI = CSE x 1.1E-06 x ABS (Noncarcinogenic)
	ABS	Absorption factor	unitless	Chem.-specific****	Region II			CDI = CSE x 9.4E-08 x ABS (Carcinogenic)
	EF	Exposure Frequency	events/yr	24	Site-specific**			CT
	ED	Exposure Duration	yrs	6	RAGS, Part A			CDI = CSE x 1.1E-06 x ABS (Noncarcinogenic)
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CSE x 9.4E-08 x ABS (Carcinogenic)
	BW	Body Weight	kg	55	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

400209

TABLE 4.6  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface and Subsurface Soil  
Exposure Point: ADC, HRRD, SPD, and ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = $CS \times IR \times FI \times EF \times ED \times CF1 \times 1/BW \times 1/AT$
	IR	Ingestion rate	mg/day	50	RAGS, Part A	25	Region II	RME
	FI	Fraction Ingested	unitless	1	RAGS, Part A			$CDI = CS \times 4.9E-07$ (Noncarcinogenic)
	EF	Exposure Frequency	days/yr	250	Site-specific**	185	Region II	$CDI = CS \times 1.8E-07$ (Carcinogenic)
	ED	Exposure Duration	yrs	25	RAGS, Part A	9	RAGS, Part A	QT
	CF1	Conversion factor	kg/mg	10-6	-			$CDI = CS \times 2.0E-07$ (Noncarcinogenic)
	BW	Body Weight	kg	70	RAGS, Part A			$CDI = CS \times 2.3E-08$ (Carcinogenic)
	AT-NC	Averaging Time (noncancer)	days	9,125	RAGS, Part A	3,285		
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
Dermal	CS	Chemical Concentration in Soil	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = $CS \times SA \times AF \times ABS \times EF \times ED \times CF1 \times 1/BW \times 1/AT$
	SA	Skin surface area available for contact	cm <sup>2</sup> /event	5,800	EFH, 1997	5,000	EFH, 1997	RME
	AF	Soil-to-skin adherence factor	mg/cm <sup>2</sup>	1	DEA, 1992			$CDI = CS \times 5.7E-05 \times ABS$ (Noncarcinogenic)
	ABS	Absorption factor	unitless	Chem.-specific****	Region II			$CDI = CS \times 2.0E-05 \times ABS$ (Carcinogenic)
	EF	Exposure Frequency	events/yr	250	Site-specific**	185	Region II	QT
	ED	Exposure Duration	yrs	25	RAGS, Part A	9	RAGS, Part A	$CDI = CS \times 3.6E-05 \times ABS$ (Noncarcinogenic)
	CF1	Conversion factor	kg/mg	10-6	-			$CDI = CS \times 4.7E-06 \times ABS$ (Carcinogenic)
	BW	Body Weight	kg	70	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	9,125	RAGS, Part A	3,285		
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

400210

TABLE 4.7  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface and Subsurface Soil  
Exposure Point: ADC, HRRD, SPD, and ARC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CS x IR x FI x EF x ED x CF1 x 1/BW x 1/AT
	IR	Ingestion rate	mg/day	480	RAGS, Part A			RME
	FI	Fraction ingested	unitless	1	RAGS, Part A			CDI = CS x 1.2E-06 (Noncarcinogenic)
	EF	Exposure Frequency	days/yr	65	Site-specific**			CDI = CS x 1.7E-06 (Carcinogenic)
	ED	Exposure Duration	yrs	1	RAGS, Part A			CI
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CS x 1.2E-06 (Noncarcinogenic)
	BW	Body Weight	kg	70	RAGS, Part A			CDI = CS x 1.7E-06 (Carcinogenic)
	AT-NC	Averaging Time (noncancer)	days	365	RAGS, Part A			
	AT- C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
Dermal	CS	Chemical Concentration in Soil	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CS x SA x AF x ABS x EF x ED x CF1 x 1/BW x 1/AT
	SA	Skin surface area available for contact	cm2/event	6,125	EFH, 1996			RME
	AF	Soil-to-skin adherence factor	mg/cm2	1	DEA, 1992			CDI = CS x 1.6E-05 x ABS (Noncarcinogenic)
	ABS	Absorption factor	unitless	Chem.-specific***	Region II			CDI = CS x 2.2E-07 x ABS (Carcinogenic)
	EF	Exposure Frequency	events/yr	65	Site-specific**			CI
	ED	Exposure Duration	yrs	1	RAGS, Part A			CDI = CS x 1.6E-05 x ABS (Noncarcinogenic)
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CS x 2.2E-07 x ABS (Carcinogenic)
	BW	Body Weight	kg	70	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	365	RAGS, Part A			
	AT- C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

400211

TABLE 4.8  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: ADC and ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CBM	Chemical Concentration in Building Materials	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = $CBM \times IR \times FI \times EF \times ED \times CF1 \times 1/BW \times 1/AT$
	IR	Ingestion rate	mg/day	50	RAGS, Part A	25	Region II	RME
	FI	Fraction Ingested	unitless	1	RAGS, Part A			$CDI = CBM \times 4.9E-07$ (Noncarcinogenic)
	EF	Exposure Frequency	days/yr	250	Site-specific**	185	Region II	$CDI = CBM \times 1.8E-07$ (Carcinogenic)
	ED	Exposure Duration	yrs	25	RAGS, Part A	9	RAGS, Part A	QI
	CF1	Conversion factor	kg/mg	10-6	-			$CDI = CS \times 2.0E-07$ (Noncarcinogenic)
	BW	Body Weight	kg	70	RAGS, Part A			$CDI = CS \times 2.3E-08$ (Carcinogenic)
	AT-NC	Averaging Time (noncancer)	days	9,125	RAGS, Part A	3,285		
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
Dermal	CBM	Chemical Concentration in Building Materials	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = $CS \times SA \times AF \times ABS \times EF \times ED \times CF1 \times 1/BW \times 1/AT$
	SA	Skin surface area available for contact	cm <sup>2</sup> /event	5,800	EFH, 1997	5,000	EFH, 1997	RME
	AF	Soil-to-skin adherence factor	mg/cm <sup>2</sup>	1	DEA, 1992			$CDI = CS \times 5.7E-05 \times ABS$ (Noncarcinogenic)
	ABS	Absorption factor	unitless	Chem.-specific****	Region II			$CDI = CS \times 2.0E-05 \times ABS$ (Carcinogenic)
	EF	Exposure Frequency	events/yr	250	Site-specific**	185	Region II	QI
	ED	Exposure Duration	yrs	25	RAGS, Part A	9	RAGS, Part A	$CDI = CS \times 3.6E-05 \times ABS$ (Noncarcinogenic)
	CF1	Conversion factor	kg/mg	10-6	-			$CDI = CS \times 4.7E-06 \times ABS$ (Carcinogenic)
	BW	Body Weight	kg	70	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	9,125	RAGS, Part A	3,285		
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

400212

TABLE 4.9  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: ADC and ARC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CBM	Chemical Concentration in Building Materials	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CBM x IR x FI x EF x ED x CF1 x 1/BW x 1/AT
	IR	Ingestion rate	mg/day	480	RAGS, Part A			RME
	FI	Fraction ingested	unitless	1	RAGS, Part A			CDI = CBM x 1.2E-06 (Noncarcinogenic)
	EF	Exposure Frequency	days/yr	65	Site-specific**			CDI = CBM x 1.7E-08 (Carcinogenic)
	ED	Exposure Duration	yrs	1	RAGS, Part A			CI
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CBM x 1.2E-06 (Noncarcinogenic)
	BW	Body Weight	kg	70	RAGS, Part A			CDI = CBM x 1.7E-08 (Carcinogenic)
	AT-NC	Averaging Time (noncancer)	days	365	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
Dermal	CBM	Chemical Concentration in Building Materials	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CBM x SA x AF x ABS x EF x ED x CF1 x 1/BW x 1/AT
	SA	Skin surface area available for contact	cm2/event	6,125	EFH, 1997			RME
	AF	Soil-to-skin adherence factor	mg/cm2	1	DEA, 1992			CDI = CBM x 1.6E-05 x ABS (Noncarcinogenic)
	ABS	Absorption factor	unitless	Chem.-specific****	Region II			CDI = CBM x 2.2E-07 x ABS (Carcinogenic)
	EF	Exposure Frequency	events/yr	65	Site-specific**			CI
	ED	Exposure Duration	yrs	1	RAGS, Part A			CDI = CBM x 1.6E-05 x ABS (Noncarcinogenic)
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CBM x 2.2E-07 x ABS (Carcinogenic)
	BW	Body Weight	kg	70	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	365	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

400213



TABLE 4.10  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Raritan River and Downstream Marsh  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CSW	Chemical Concentration in Surface Water	mg/l	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = $CSW \times CR \times ET \times EF \times ED \times 1/BW \times 1/AT$
	CR	Contact rate	l/hr	0.05	RAGS, Part A	9	RAGS, Part A	RME
	ET	Exposure Time	hr/event	2.8	RAGS, Part A			CDI = $CSW \times 1.2E-04$ (Noncarcinogenic)
	EF	Exposure Frequency	events/yr	24	Site-specific**			CDI = $CSW \times 4.1E-05$ (Carcinogenic)
	ED	Exposure Duration	yrs	24	RAGS, Part A			CT
	BW	Body Weight	kg	70	RAGS, Part A			CDI = $CSW \times 1.2E-04$ (Noncarcinogenic)
	AT-NC	Averaging Time (noncancer)	days	8,760	RAGS, Part A			CDI = $CSW \times 1.5E-05$ (Carcinogenic)
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
Dermal	CSW	Chemical Concentration in Surface Water	mg/l	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = $CSW \times SA \times PC \times ET \times EF \times ED \times CF \times 1/BW \times 1/AT$
	SA	Skin surface area available for contact	cm <sup>2</sup> /event	23,000	EFH, 1997	20,000	EFH, 1997	RME
	PC	Permeability Constant	cm/hr	Chem.-specific	DEA, 1992			CDI = $CSW \times 5.6E-02 \times PC$ (Noncarcinogenic)
	ET	Exposure time	hrs/day	2.8	RAGS, Part A			CDI = $CSW \times 1.9E-02 \times PC$ (Carcinogenic)
	EF	Exposure Frequency	events/yr	24	Site-specific**			CT
	ED	Exposure Duration	yrs	24	RAGS, Part A			CDI = $CSW \times 4.8E-02 \times PC$ (Noncarcinogenic)
	CF1	Conversion factor	l/cm <sup>3</sup>	10-3	-			CDI = $CSW \times 6.2E-03 \times PC$ (Carcinogenic)
	BW	Body Weight	kg	70	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	8,760	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
						3,285		

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TABLE 4.11  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: Raritan River and Downstream Marsh  
Receptor Population: Residents  
Receptor Age: Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference	CT Value	CT Rationale/Reference	Intake Equation/Model Name
Ingestion	CSW	Chemical Concentration in Surface Water	mg/l	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average		Chronic Daily Intake (CDI) (mg/kg/day) = CSW x CR x ET x EF x ED x 1/BW x 1/AT
	CR	Contact Rate	1/hr	0.05	RAGS, Part A			RME
	ET	Exposure time	hr/event	2.6	RAGS, Part A			CDI = CSW x 5.7E-04 (Noncarcinogenic)
	EF	Exposure Frequency	events/yr	24	Site-specific**			CDI = CSW x 4.9E-05 (Carcinogenic)
	ED	Exposure Duration	yrs	6	RAGS, Part A			CI
	BW	Body Weight	kg	15	RAGS, Part A			CDI = CSW x 5.7E-04 (Noncarcinogenic)
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			CDI = CSW x 4.9E-05 (Carcinogenic)
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
Dermal	CS	Chemical Concentration in Surface Water	mg/l	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	EFH, 1997	Chronic Daily Intake (CDI) (mg/kg/day) = CSW x SA x PC x ET x EF x ED x CF x 1/BW x 1/AT
	SA	Skin surface area available for contact	cm <sup>2</sup> /event	8,023	EFH, 1997			RME
	PC	Permeability Constant	cm/hr	Chem.-specific	DEA, 1992			CDI = CSW x 9.1E-02 x PC (Noncarcinogenic)
	ET	Exposure time	hrs/day	2.6	RAGS, Part A			CDI = CSW x 7.8E-03 x PC (Carcinogenic)
	EF	Exposure Frequency	events/yr	24	Site-specific**			CI
	ED	Exposure Duration	yrs	6	RAGS, Part A			CDI = CSW x 8.0E-02 x PC (Noncarcinogenic)
	CF1	Conversion factor	l/cm <sup>3</sup>	10-3	-			CDI = CSW x 8.8E-03 x PC (Carcinogenic)
	BW	Body Weight	kg	15	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

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TABLE 4.12  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: Raritan River and Downstream Marsh  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CSE	Chemical Concentration in Sediment	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CSE x IR x FI x EF x ED x CF1 x 1/BW x 1/AT
	IR	Ingestion rate	mg/day	100	RAGS, Part A			RME
	FI	Fraction Ingested	unitless	1	RAGS, Part A			CDI = CSE x 9.4E-08 (Noncarcinogenic)
	EF	Exposure Frequency	days/yr	24	Site-specific**			CDI = CSE x 3.2E-08 (Carcinogenic)
	ED	Exposure Duration	yrs	24	RAGS, Part A	9	RAGS, Part A	CT
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CSE x 9.4E-08 (Noncarcinogenic)
	BW	Body Weight	kg	70	RAGS, Part A			CDI = CSE x 1.2E-08 (Carcinogenic)
	AT-NC	Averaging Time (noncancer)	days	8,760	RAGS, Part A	3,285		
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
Dermal	CSE	Chemical Concentration in Sediment	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CSE x SA x AF x ABS x EF x ED x CF x 1/BW x 1/AT
	SA	Skin surface area available for contact	cm2/event	2,500	EFH, 1997			RME
	AF	Sediment-to-skin adherence factor	mg/cm2	1	DEA, 1992			CDI = CSE x 2.4E-06 x ABS (Noncarcinogenic)
	ABS	Absorption factor	unitless	Chem.-specific****	Region II			CDI = CSE x 8.1E-07 x ABS (Carcinogenic)
	EF	Exposure Frequency	events/yr	24	Site-specific**			CT
	ED	Exposure Duration	yrs	24	RAGS, Part A	9	RAGS, Part A	CDI = CSE x 2.4E-06 x ABS (Noncarcinogenic)
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CSE x 3.1E-07 x ABS (Carcinogenic)
	BW	Body Weight	kg	70	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	8,760	RAGS, Part A	3,285		
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

400216

TABLE 4.13  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: Raritan River and Downstream Marsh  
Receptor Population: Residents  
Receptor Age: Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CSE	Chemical Concentration in Sediment	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CSE x IR x FI x EF x ED x CF1 x 1/BW x 1/AT
	IR	Ingestion rate	mg/day	200	RAGS, Part A			RME
	FI	Fraction Ingested	unitless	1	RAGS, Part A			CDI = CSE x 8.8E-07 (Noncarcinogenic)
	EF	Exposure Frequency	days/yr	24	Site-specific**			CDI = CSE x 7.5E-08 (Carcinogenic)
	ED	Exposure Duration	yrs	6	RAGS, Part A			CI
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CSE x 8.8E-07 (Noncarcinogenic)
	BW	Body Weight	kg	15	RAGS, Part A			CDI = CSE x 7.5E-08 (Carcinogenic)
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			
Dermal	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			
	CSE	Chemical Concentration in Sediment	mg/kg	Chem.-specific 95th UCL or Max.*	-	Chem.-specific Average	-	Chronic Daily Intake (CDI) (mg/kg/day) = CSE x SA x AF x ABS x EF x ED x CF x 1/BW x 1/AT
	SA	Skin surface area available for contact	cm2/event	1,600	EFH, 1997			RME
	AF	Sediment-to-skin adherence factor	mg/cm2	1	DEA, 1992			CDI = CSE x 7.0E-06 x ABS (Noncarcinogenic)
	ABS	Absorption factor	unitless	Chem.-specific****	Region II			CDI = CSE x 6.0E-07 x ABS (Carcinogenic)
	EF	Exposure Frequency	events/yr	24	Site-specific**			CI
	ED	Exposure Duration	yrs	6	RAGS, Part A			CDI = CSE x 7.0E-06 x ABS (Noncarcinogenic)
	CF1	Conversion factor	kg/mg	10-6	-			CDI = CSE x 6.0E-07 x ABS (Carcinogenic)
	BW	Body Weight	kg	15	RAGS, Part A			
	AT-NC	Averaging Time (noncancer)	days	2,190	RAGS, Part A			
	AT-C	Averaging Time (cancer)	days	25,550	RAGS, Part A			

400217

TABLE 4.14  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
HORSESHOE ROAD COMPLEX, SAYREVILLE, NEW JERSEY

## References:

RAGS, Part A. US EPA, Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual, Part A, Interim Final. December 1989.  
EFH, 1997. USEPA, Exposure Factors Handbook. August 1997.  
DEA, 1992. Dermal Exposure Assessment: Principles and Applications, Interim Report. January 1992.  
Region II. EPA Region II Risk Assessment Specialists.

## Notes:

\* - The 95th UCL will be used as the chemical concentration, unless the 95th UCL exceeds the maximum detected concentration. In this case, the maximum detection will be used.

\*\* - Site-specific exposure time and frequency based on site location and accessibility.

\*\*\* - Surface area based on the average skin surface area for males and females the following body parts:

Trespasser (Youth) for surface soil - 2,535 cm<sup>2</sup> based on lower legs.

Trespasser (Youth) for surface water and sediment - 920 cm<sup>2</sup> based on feet.

Site workers (Adult) for surface and subsurface soil - 5,800 cm<sup>2</sup> based on forearms, hands, and lower legs.

Construction Worker (Adult) for surface and subsurface soil - 6,125 cm<sup>2</sup> based on upper extremities and lower legs.

Resident (Adult) for surface water - 23,000 based on entire body.

Resident (Child) for surface water - 8,023 cm<sup>2</sup> based on entire body.

Resident (Adult) for sediment - 2,500 cm<sup>2</sup> based on hands and feet.

Resident (Child) for sediment - 1,000 cm<sup>2</sup> based on hands and feet.

\*\*\*\* - Region II currently provides dermal absorption factors and their references for the following chemicals:

Arsenic 3% - Wester, et al (1993a)

PAHs (benzo(a)pyrene) 13% - Wester, et al (1990)

Cadmium 0.1% - Wester, et al (1992a), USEPA (1992)

PCBs (Aroclor 1254 and 1242) 14% - Wester, et al (1993b)

Chlordane 4% - Wester, et al (1992b)

Pentachlorophenol 25% - Wester, et al (1993c)

DDT 3% - Wester, et al (1990)

Generic default SVOCs 10%

TCDD (dioxin) <10% organic soil 3% USEPA (1992)

Inorganics 1%

<10% organic soil 0.1% USEPA (1992)

400218

TABLE 5.1  
NON-CANCER CHRONIC TOXICITY DATA -- ORAL  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)
<b>Volatile Organics</b>							
Acetone	Chronic	1.0E-001	mg/kg/day	Liver/Kidney	1000	IRIS (1)	11/09/98
Benzene	Chronic	3.0E-003	mg/kg/day	-	-	NCEA (3)	10/01/98
Bromodichloromethane	Chronic	2.0E-002	mg/kg/day	Kidney	1000	IRIS	11/09/98
Bromomethane	Chronic	1.4E-003	mg/kg/day	Forestomach	1000	IRIS	11/09/98
2-Butanone	Chronic	6.0E-001	mg/kg/day	Fetus	3000	IRIS	11/09/98
Carbon Disulfide	Chronic	1.0E-001	mg/kg/day	Fetus	100	IRIS	11/09/98
Carbon Tetrachloride	Chronic	7.0E-004	mg/kg/day	Liver	1000	IRIS	11/09/98
Chlorobenzene	Chronic	2.0E-002	mg/kg/day	Liver	1000	IRIS	11/09/98
Chloroethane	Chronic	4.0E-001	mg/kg/day	-	-	NCEA	10/01/98
Chloroform	Chronic	1.0E-002	mg/kg/day	Liver	1000	IRIS	11/09/98
Chloromethane	Chronic	-	mg/kg/day	-	-	-	-
1,1-Dichloroethane	Chronic	1.0E-001	mg/kg/day	None	1000	HEAST (2)	1997
1,2-Dichloroethane	Chronic	3.0E-002	mg/kg/day	-	-	NCEA	10/01/98
1,1-Dichloroethene	Chronic	9.0E-003	mg/kg/day	Liver	1000	IRIS	11/09/98
cis 1,2-Dichloroethene	Chronic	1.0E-002	mg/kg/day	Blood	3000	HEAST	1997
trans 1,2-Dichloroethene	Chronic	2.0E-002	mg/kg/day	Blood	1000	IRIS	11/09/98
total 1,2-Dichloroethene	Chronic	9.0E-003	mg/kg/day	Liver	1000	IRIS	11/09/98
1,2-Dichloropropane	Chronic	-	mg/kg/day	-	-	-	-
trans-1,3-Dichloropropene	Chronic	3.0E-004	mg/kg/day	Organ weights	10000	IRIS	11/09/98
Ethylbenzene	Chronic	1.0E-001	mg/kg/day	Liver/Kidney	1000	IRIS	11/09/98
Methylene Chloride	Chronic	8.0E-002	mg/kg/day	Liver	100	IRIS	11/09/98
4-Methyl-2-Pentanone	Chronic	8.0E-002	mg/kg/day	Whole Body/Liver	3000	HEAST	1997
Styrene	Chronic	2.0E-001	mg/kg/day	Blood/liver	1000	IRIS	11/09/98
Tetrachloroethene	Chronic	1.0E-002	mg/kg/day	Liver	1000	IRIS	11/09/98
1,1,2,2-Tetrachloroethane	Chronic	6.0E-002	mg/kg/day	-	-	NCEA	10/01/98
Toluene	Chronic	2.0E-001	mg/kg/day	Liver/Kidney	1000	IRIS	11/09/98
1,1,1-Trichloroethane	Chronic	2.0E-002	mg/kg/day	-	3000	NCEA	10/01/98
1,1,2-Trichloroethane	Chronic	4.0E-003	mg/kg/day	Blood	1000	IRIS	11/09/98
Trichloroethene	Chronic	6.0E-003	mg/kg/day	-	3000	NCEA	10/01/98
Vinyl Chloride	Chronic	-	mg/kg/day	-	-	-	-
Xylenes (Total)	Chronic	2.0E+000	mg/kg/day	CNS/Whole Body	100	IRIS	11/09/98

400219

TABLE 5.1  
 NON-CANCER CHRONIC TOXICITY DATA -- ORAL  
 HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)
<b>Semivolatile Organics</b>							
Acenaphthene	Chronic	6.0E-002	mg/kg/day	Liver	3000	IRIS	11/09/98
Acenaphthylene	Chronic	-	mg/kg/day	-	-	-	-
Anthracene	Chronic	3.0E-001	mg/kg/day	None	3000	IRIS	11/09/98
Benzo(a)anthracene	Chronic	-	mg/kg/day	-	-	-	-
Benzo(a)pyrene	Chronic	-	mg/kg/day	-	-	-	-
Benzo(b)fluoranthene	Chronic	-	mg/kg/day	-	-	-	-
Benzo(g,h,i)perylene	Chronic	-	mg/kg/day	-	-	-	-
Benzo(k)fluoranthene	Chronic	-	mg/kg/day	-	-	-	-
Bis(2-chloroethyl)ether	Chronic	-	mg/kg/day	-	-	-	-
Bis(2-ethylhexyl)phthalate	Chronic	2.0E-002	mg/kg/day	Liver	1000	IRIS	11/09/98
Butylbenzyl phthalate	Chronic	2.0E-001	mg/kg/day	Liver	1000	IRIS	11/09/98
Carbazole	Chronic	-	mg/kg/day	-	-	-	-
4-Chloroaniline	Chronic	4.0E-003	mg/kg/day	Spleen	3000	IRIS	11/09/98
2-Chloronaphthalene	Chronic	8.0E-002	mg/kg/day	-	-	-	-
Chrysene	Chronic	-	mg/kg/day	-	-	-	-
Dibenzo(a,h)anthracene	Chronic	-	mg/kg/day	-	-	-	-
Dibenzofuran	Chronic	4.0E-003	mg/kg/day	-	-	NCEA	10/01/98
Di-n-butyl phthalate	Chronic	1.0E-001	mg/kg/day	Whole Body	1000	IRIS	11/09/98
1,2-Dichlorobenzene	Chronic	9.0E-002	mg/kg/day	None	1000	IRIS	11/09/98
1,3-Dichlorobenzene	Chronic	3.0E-002	mg/kg/day	-	-	NCEA	10/01/98
1,4-Dichlorobenzene	Chronic	3.0E-002	mg/kg/day	-	-	NCEA	10/01/98
2,4-Dichlorophenol	Chronic	3.0E-003	mg/kg/day	Hypersensitivity	100	IRIS	11/09/98
Diethyl phthalate	Chronic	8.0E-001	mg/kg/day	Whole Body/Organs	1000	IRIS	11/09/98
2,4-Dimethylphenol	Chronic	2.0E-002	mg/kg/day	Clinical signs/Blood	3000	IRIS	11/09/98
2,4-Dinitrotoluene	Chronic	2.0E-003	mg/kg/day	Nervous system	100	IRIS	11/09/98
Di-n-octyl phthalate	Chronic	2.0E-002	mg/kg/day	Kidney/Liver	1000	HEAST	1997

400220

TABLE 5.1  
 NON-CANCER CHRONIC TOXICITY DATA – ORAL  
 HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)
<b>Semivolatile Organics (Cont'd)</b>							
Fluoranthene	Chronic	4.0E-002	mg/kg/day	Kidney/Liver/Blood	3000	IRIS	11/09/98
Fluorene	Chronic	4.0E-002	mg/kg/day	Blood	3000	IRIS	11/09/98
Hexachlorobutadiene	Chronic	2.0E-004	mg/kg/day	Kidney	1000	HEAST	1997
Hexachlorocyclopentadiene	Chronic	7.0E-003	mg/kg/day	Stomach	1000	IRIS	11/09/98
Hexachloroethane	Chronic	1.0E-003	mg/kg/day	Kidney	1000	IRIS	11/09/98
Indeno(1,2,3-cd)pyrene	Chronic	-	mg/kg/day	-	-	-	-
Isophorone	Chronic	2.0E-001	mg/kg/day	Kidney	1000	IRIS	11/09/98
2-Methylnaphthalene	Chronic	2.0E-002	mg/kg/day	-	-	RBC (7)	10/01/98
2-Methylphenol	Chronic	5.0E-002	mg/kg/day	Whole Body/CNS	1000	IRIS	11/09/98
4-Methylphenol	Chronic	5.0E-003	mg/kg/day	CNS/Respiratory	1000	HEAST	1997
Naphthalene	Chronic	2.0E-002	mg/kg/day	Whole Body	1000	NCEA	10/01/98
Nitrobenzene	Chronic	5.0E-004	mg/kg/day	Blood/Adrenal	10000	IRIS	11/09/98
n-Nitrosodiphenylamine	Chronic	-	mg/kg/day	-	-	-	-
2-Nitrophenol	Chronic	-	mg/kg/day	-	-	-	-
4-Nitrophenol	Chronic	8.0E-003	mg/kg/day	-	-	NCEA	10/01/98
Pentachlorophenol	Chronic	3.0E-002	mg/kg/day	Liver/Kidney	100	IRIS	11/09/98
Phenanthrene	Chronic	-	mg/kg/day	-	-	-	-
Phenol	Chronic	6.0E-001	mg/kg/day	Fetus	100	IRIS	11/09/98
Pyrene	Chronic	3.0E-002	mg/kg/day	Kidney	3000	IRIS	11/09/98
1,2,3-Trichlorobenzene	Chronic	-	mg/kg/day	-	-	-	-
1,2,4-Trichlorobenzene	Chronic	1.0E-002	mg/kg/day	Adrenal	1000	IRIS	11/09/98
2,4,6-Trichlorophenol	Chronic	-	mg/kg/day	-	-	-	-
2,4,5-Trichlorophenol	Chronic	1.0E-001	mg/kg/day	Liver/Kidney	1000	IRIS	11/09/98



TABLE 5.1  
 NON-CANCER CHRONIC TOXICITY DATA -- ORAL  
 HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)
<b>Pesticides/PCBs</b>							
Aldrin	Chronic	3.0E-005	mg/kg/day	Liver	1000	IRIS	11/09/98
4,4'-DDD	Chronic	-	mg/kg/day	-	-	-	-
4,4'-DDE	Chronic	-	mg/kg/day	-	-	-	-
4,4'-DDT	Chronic	5.0E-004	mg/kg/day	Liver	100	IRIS	11/09/98
alpha-BHC	Chronic	-	mg/kg/day	-	-	-	-
beta-BHC	Chronic	-	mg/kg/day	-	-	-	-
delta-BHC	Chronic	-	mg/kg/day	-	-	-	-
gamma-BHC (Lindane)	Chronic	3.0E-004	mg/kg/day	Liver/Kidney	1000	IRIS	11/09/98
alpha-Chlordane	Chronic	5.0E-004	mg/kg/day	Liver	300	IRIS (4)	11/09/98
gamma-Chlordane	Chronic	5.0E-004	mg/kg/day	Liver	300	IRIS (4)	11/09/98
Dieldrin	Chronic	5.0E-005	mg/kg/day	Liver	100	IRIS	11/09/98
Endosulfan I	Chronic	6.0E-003	mg/kg/day	Whole Body/Kidney	100	IRIS (5)	11/09/98
Endosulfan II	Chronic	6.0E-003	mg/kg/day	Whole Body/Kidney	100	IRIS (5)	11/09/98
Endrin	Chronic	3.0E-004	mg/kg/day	CNS/Liver	100	IRIS	11/09/98
Endrin Aldehyde	Chronic	-	mg/kg/day	-	-	-	-
Endrin Ketone	Chronic	-	mg/kg/day	-	-	-	-
Heptachlor	Chronic	5.0E-004	mg/kg/day	Liver	300	IRIS	11/09/98
Heptachlor Epoxide	Chronic	1.3E-005	mg/kg/day	Liver	1000	IRIS	11/09/98
Methoxychlor	Chronic	5.0E-003	mg/kg/day	Reproductive	1000	IRIS	11/09/98
PCBs: Aroclor 1242	Chronic	-	mg/kg/day	-	-	-	-
Aroclor 1248	Chronic	-	mg/kg/day	-	-	-	-
Aroclor 1254	Chronic	2.0E-005	mg/kg/day	Immune System	300	IRIS	11/09/98
Aroclor 1260	Chronic	-	mg/kg/day	-	-	-	-
<b>Dioxin</b>							
2,3,7,8-TCDD	Chronic	-	mg/kg/day	-	-	-	-

400222

TABLE 5.1  
NON-CANCER CHRONIC TOXICITY DATA – ORAL  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)
<b>Inorganics</b>							
Aluminum	Chronic	1.0E+000	mg/kg/day	-	100	NCEA	10/01/98
Antimony	Chronic	4.0E-004	mg/kg/day	Whole Body/Blood	1000	IRIS	11/09/98
Arsenic	Chronic	3.0E-004	mg/kg/day	Skin	3	IRIS	11/09/98
Barium	Chronic	7.0E-002	mg/kg/day	Cardiovascular	3	IRIS	11/09/98
Beryllium	Chronic	2.0E-003	mg/kg/day	Small Intestine	300	IRIS	11/09/98
Cadmium (food)	Chronic	1.0E-003	mg/kg/day	Kidney	10	IRIS	11/09/98
Cadmium (water)	Chronic	5.0E-004	mg/kg/day	Kidney	10	IRIS	11/09/98
Chromium III (insoluble salts)	Chronic	1.5E+000	mg/kg/day	None	100	IRIS	11/09/98
Chromium VI	Chronic	3.0E-003	mg/kg/day	None	300	IRIS	11/09/98
Cobalt	Chronic	6.0E-002	mg/kg/day	-	-	NCEA	10/01/98
Copper	Chronic	4.0E-002	mg/kg/day	-	-	NCEA	10/01/98
Cyanide (free)	Chronic	2.0E-002	mg/kg/day	Weight loss/thyroid	500	IRIS	11/08/98
Lead (and compounds-inorg.)**	Chronic	-	mg/kg/day	-	-	-	-
Manganese	Chronic	2.4E-002	mg/kg/day	-	3	NCEA	10/01/98
Mercury (elemental)	Chronic	-	mg/kg/day	-	-	-	-
Nickel (soluble salt)	Chronic	2.0E-002	mg/kg/day	Whole Body Organs	300	IRIS	11/09/98
Selenium	Chronic	5.0E-003	mg/kg/day	Whole Body	3	IRIS	11/09/98
Silver	Chronic	5.0E-003	mg/kg/day	Skin	3	IRIS	11/09/98
Thallium	Chronic	7.0E-005	mg/kg/day	Liver/blood/hair	-	RBC	10/01/98
Vanadium	Chronic	7.0E-003	mg/kg/day	None	100	HEAST	1997
Zinc (and compounds)	Chronic	3.0E-001	mg/kg/day	Blood	3	IRIS	11/08/98

## Notes:

- Calcium, iron, magnesium, potassium, and sodium are considered essential nutrients and will not be quantitatively evaluated in the risk assessment.

\* - A modifying factor of 3 was used to address the lack of unequivocal data for respiratory tract effects.

\*\* - Since no noncarcinogenic toxicity values are currently established for lead, only a qualitative evaluation of this chemical can be performed. The USEPA's Revised Interim Soil Guidance for CERCLA Sites and RCRA Corrective Action Facilities, OSWER Directive 8355.4-12, recommends screening levels for soil of 400 ppm for residential land use (USEPA, 1994). New Jersey's Drinking Water and Ground Water Update recommends an action level for lead in drinking water of 15 ug/l (USEPA, 1993).

(1) All toxicity values were obtained from Integrated Risk Information System (IRIS) (on-line November 1998) unless otherwise noted.

(2) Toxicity values were obtained from Health Effects Assessment Summary Tables (HEAST) Annual FY-1997.

(3) Toxicity values were obtained by the National Center for Environmental Assessment (NCEA). EPA Region III Risk-based Concentration (RBC) Table 10/1/98.

(4) The noncarcinogenic toxicity values for technical chlordane are reported from IRIS, as the individual alpha and gamma-chlordane isomers do not have established noncarcinogenic toxicity values.

(5) The noncarcinogenic toxicity values for endosulfan are reported from IRIS, as the individual endosulfan I and endosulfan II isomers do not have established noncarcinogenic toxicity values.

(6) The total intake of manganese is estimated to be 10 mg/day. Of the 10 mg/day, 5 mg/day is subtracted as the estimated daily dietary intake. The remaining value, 5mg/day, was then divided by 70 kg (adult body weight) and by a modifying factor of 3 (sensitive individuals).

(7) Toxicity values were obtained from EPA, Region III, Risk-based Concentration (RBC) table, 10/1/98.

**TABLE 5.2**  
**NON-CANCER TOXICITY DATA -- INHALATION**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)
N/A - Not Applicable. No Chemicals of Potential Concern evaluated for inhalation exposures.									

N/A = Not Applicable

(1) Provide equation used for derivation in text.

(2) For IRIS values, provide the date IRIS was searched.

For HEAST values, provide the date of HEAST.

For NCEA values, provide the date of the article provided by NCEA.

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09/24/99

**TABLE 5.3**  
**NON-CANCER TOXICITY DATA – SPECIAL CASE CHEMICALS**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Chemical of Potential Concern	Chronic/ Subchronic	Value	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of Primary Target Organ	Date (MM/DD/YY)
<b>N/A - Not Applicable. No Special Case Chemicals evaluated.</b>							

400225

09/24/99

TABLE 6.1  
CANCER TOXICITY DATA -- ORAL  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Chemical of Potential Concern	Oral Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (MM/DD/YY)
<b>Volatile Organics</b>					
Acetone	-	-	D	-	-
Benzene	2.9E-002	(mg/kg/day)-1	A	IRIS	11/09/98
Bromodichloromethane	6.2E-002	(mg/kg/day)-1	B2	IRIS	11/09/98
Bromomethane	-	-	D	-	-
2-Butanone	-	-	D	-	-
Carbon Disulfide	-	-	-	-	-
Carbon Tetrachloride	1.3E-001	(mg/kg/day)-1	B2	IRIS	11/09/98
Chlorobenzene	-	-	D	-	-
Chloroethane	2.9E-003	(mg/kg/day)-1	-	NCEA	10/01/98
Chloroform	6.1E-003	(mg/kg/day)-1	B2	IRIS	11/09/98
Chloromethane	1.3E-002	(mg/kg/day)-1	C	HEAST	1987
1,1-Dichloroethane	-	-	C	-	-
1,2-Dichloroethane	9.1E-002	(mg/kg/day)-1	B2	IRIS	11/09/98
1,1-Dichloroethene	6.0E-001	(mg/kg/day)-1	C	IRIS	11/09/98
cis 1,2-Dichloroethene	-	-	D	-	-
trans 1,2-Dichloroethene	-	-	-	-	-
total 1,2-Dichloroethene	-	-	D	-	-
1,2-Dichloropropane	6.8E-002	(mg/kg/day)-1	B2	HEAST	1987
trans 1,3-Dichloropropene	1.8E-001	(mg/kg/day)-1	B2	IRIS	11/09/98
Ethylbenzene	-	-	D	-	-
Methylene Chloride	7.5E-003	(mg/kg/day)-1	B2	IRIS	11/09/98
4-Methyl-2-Pentanone	-	-	-	-	-
Styrene	-	-	-	-	-
Tetrachloroethene	5.2E-002	(mg/kg/day)-1	B2-C	NCEA	10/01/98
1,1,2,2-Tetrachloroethane	2.0E-001	(mg/kg/day)-1	C	IRIS	11/09/98
Toluene	-	-	D	-	-
1,1,1-Trichloroethane	-	-	D	-	-
1,1,2-Trichloroethane	5.7E-002	(mg/kg/day)-1	C	IRIS	11/09/98
Trichloroethene	1.1E-002	(mg/kg/day)-1	B2-C	NCEA	10/01/98
Vinyl Chloride	1.9E+000	(mg/kg/day)-1	A	HEAST	1997
Xylenes (Total)	-	-	D	-	-

400226

TABLE 6.1  
CANCER TOXICITY DATA -- ORAL  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Chemical of Potential Concern	Oral Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (MM/DD/YY)
<b>Semivolatile Organics</b>					
Acenaphthene	-	-	-	-	-
Acenaphthylene	-	-	D	-	-
Anthracene	-	-	D	-	-
Benzo(a)anthracene	7.3E-001	(mg/kg/day)-1	B2	IRIS*	11/09/98
Benzo(a)pyrene	7.3E+000	(mg/kg/day)-1	B2	IRIS	11/09/98
Benzo(b)fluoranthene	7.3E-001	(mg/kg/day)-1	B2	IRIS*	11/09/98
Benzo(g,h,i)perylene	-	-	D	-	-
Benzo(k)fluoranthene	7.3E-002	(mg/kg/day)-1	B2	IRIS*	11/09/98
Bis(2-chloroethyl)ether	1.1E+000	(mg/kg/day)-1	B2	IRIS	11/09/98
Bis(2-ethoxyethyl)phthalate	1.4E-002	(mg/kg/day)-1	B2	IRIS	11/09/98
Butylbenzyl phthalate	-	-	C	-	-
Carbazole	2.0E-002	(mg/kg/day)-1	B2	HEAST	1997
4-Chloroaniline	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
Chrysene	7.3E-003	(mg/kg/day)-1	B2	IRIS*	11/09/98
Dibenzo(a,h)anthracene	7.3E+000	(mg/kg/day)-1	B2	IRIS	11/09/98
Dibenzofuran	-	-	D	-	-
Di-n-butyl phthalate	-	-	D	-	-
1,2-Dichlorobenzene	-	-	D	-	-
1,3-Dichlorobenzene	-	-	D	-	-
1,4-Dichlorobenzene	2.4E-002	(mg/kg/day)-1	C	HEAST	1997
2,4-Dichlorophenol	-	-	-	-	-
Diethyl phthalate	-	-	D	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
Di-n-octyl phthalate	-	-	D	-	-

400227

TABLE 6.1  
CANCER TOXICITY DATA - ORAL  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Chemical of Potential Concern	Oral Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (MM/DD/YY)
<b>Semivolatile Organics (Cont'd)</b>					
Fluoranthene	-	-	D	-	-
Fluorene	-	-	D	-	-
Hexachlorobutadiene	7.8E-002	(mg/kg/day)-1	C	IRIS	11/09/98
Hexachlorocyclopentadiene	-	-	D	-	-
Hexachloroethane	1.4E-002	(mg/kg/day)-1	C	IRIS	11/09/98
Indeno(1,2,3-cd)pyrene	7.3E-001	(mg/kg/day)-1	B2	IRIS*	11/09/98
Isophorone	9.5E-004	(mg/kg/day)-1	C	IRIS	11/09/98
2-Methylnaphthalene	-	-	-	-	-
2-Methylphenol	-	-	C	-	-
4-Methylphenol	-	-	C	-	-
Naphthalene	-	-	D	-	-
Nitrobenzene	-	-	D	-	-
n-Nitrosodiphenylamine	4.9E-003	(mg/kg/day)-1	B2	IRIS	11/09/98
2-Nitrophenol	-	-	D	-	-
4-Nitrophenol	-	-	-	-	-
Pentachlorophenol	1.2E-001	(mg/kg/day)-1	B2	IRIS	11/09/98
Phenanthrene	-	-	D	-	-
Phenol	-	-	D	-	-
Pyrene	-	-	D	-	-
1,2,3-Trichlorobenzene	-	-	D	-	-
1,2,4-Trichlorobenzene	-	-	D	-	-
2,4,6-Trichlorophenol	1.1E-002	(mg/kg/day)-1	B2	IRIS	11/09/98
2,4,5-Trichlorophenol	-	-	-	-	-

400228

TABLE 6.1  
CANCER TOXICITY DATA - ORAL  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Chemical of Potential Concern	Oral Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (MM/DD/YY)
<b>Pesticides/PCBs</b>					
Aldrin	1.7E+001	(mg/kg/day)-1	B2	IRIS	11/09/98
4,4'-DDD	2.4E-001	(mg/kg/day)-1	B2	IRIS	11/09/98
4,4'-DDE	3.4E-001	(mg/kg/day)-1	B2	IRIS	11/09/98
4,4'-DDT	3.4E-001	(mg/kg/day)-1	B2	IRIS	11/09/98
alpha-BHC	6.3E+000	(mg/kg/day)-1	B2	IRIS	11/09/98
beta-BHC	1.8E+000	(mg/kg/day)-1	C	IRIS	02/15/98
delta-BHC	-	-	D	-	-
gamma-BHC (Lindane)	1.3E+000	(mg/kg/day)-1	B2-C	HEAST	1997
alpha-Chlordane	3.5E-001	(mg/kg/day)-1	B2	IRIS (4)	11/09/98
gamma-Chlordane	3.5E-001	(mg/kg/day)-1	B2	IRIS (4)	11/09/98
Dieldrin	1.6E+001	(mg/kg/day)-1	B2	IRIS	11/09/98
Endosulfan I	-	-	-	(5)	-
Endosulfan II	-	-	-	(5)	-
Endrin	-	-	D	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	4.5E+000	(mg/kg/day)-1	B2	IRIS	11/09/98
Heptachlor Epoxide	9.1E+000	(mg/kg/day)-1	B2	IRIS	11/09/98
Methoxychlor	-	-	D	-	-
PCBs: Aroclor 1242	2.0E+00 (soil/food); 4.0E-01 (water)	(mg/kg/day)-1	B2	IRIS	11/09/98
Aroclor 1248	2.0E+00 (soil/food); 4.0E-01 (water)	(mg/kg/day)-1	B2	IRIS	11/09/98
Aroclor 1254	2.0E+00 (soil/food); 4.0E-01 (water)	(mg/kg/day)-1	B2	IRIS	11/09/98
Aroclor 1280	2.0E+00 (soil/food); 4.0E-01 (water)	(mg/kg/day)-1	B2	IRIS	11/09/98
<b>Dioxin</b>					
2,3,7,8-TCDD	1.5E+005	(mg/kg/day)-1	B2	HEAST	1997

400229



TABLE 6.1  
 CANCER TOXICITY DATA – ORAL  
 HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Chemical of Potential Concern	Oral Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (MM/DD/YY)
<b>Inorganics</b>					
Aluminum	-	-	-	-	-
Antimony	-	-	-	-	-
Arsenic	1.5E+000	(mg/kg/day)-1	A	IRIS	11/09/98
Barium	-	-	-	-	-
Beryllium	-	-	B1	IRIS	11/09/98
Cadmium	-	-	B1	-	-
Chromium III (insoluble salts)	-	-	D	-	-
Chromium VI	-	-	A	-	-
Cobalt	-	-	-	-	-
Copper	-	-	D	-	-
Cyanide	-	-	D	-	-
Lead (and compounds-inorg.)**	-	-	B2	-	-
Manganese	-	-	D	-	-
Mercury	-	-	D	-	-
Nickel (soluble salt)	-	-	-	-	-
Selenium (and compounds)	-	-	D	-	-
Silver	-	-	D	-	-
Thallium	-	-	D	-	-
Vanadium	-	-	D	-	-
Zinc (and compounds)	-	-	D	-	-

400230

Notes:

- Calcium, iron, magnesium, potassium, and sodium are considered essential nutrients and will not be quantitatively evaluated in the risk assessment.

\*Relative potency values were used in conjunction with the benzo(a)pyrene oral slope factor per USEPA Guidance (July) (USEPA, 1983a).

\*\*Since no carcinogenic toxicity values are currently established for lead, only a qualitative evaluation of this chemical can be performed. The USEPA's Revised Interim Soil Guidance for CERCLA Sites and RCRA Corrective Action Facilities, OSWER Directive 9355.4-12, recommends screening levels for soil of 400 ppm residential land use (USEPA, 1994). New Jersey's Drinking Water and Ground Water Update recommends an action level for lead in drinking water of 15 ug/l (USEPA, 1993).

(1) All toxicity values were obtained from IRIS (on-line November 9, 1998) unless otherwise noted.

(2) Toxicity values were obtained from HEAST Annual FY-1997.

(3) Toxicity values were obtained from the National Center for Environmental Assessment. EPA Region III Risk-based Concentration (RBC) Table 10/1/98.

(4) The carcinogenic toxicity values for technical chlordane are reported, as the individual alpha and gamma-chlordane isomers do not have established carcinogenic toxicity levels.

(5) No carcinogenic toxicity values are currently established for endosulfan or its isomers endosulfan I and endosulfan II.

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

Weight of Evidence:

Known/Likely

Cannot be Determined

Not Likely

400231

TABLE 6.2  
CANCER TOXICITY DATA -- INHALATION  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Chemical of Potential Concern	Unit Risk	Units	Adjustment	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (1) (MM/DD/YY)
N/A - Not Applicable. No Chemicals of Potential Concern evaluated for inhalation exposures.								

IRIS = Integrated Risk Information System

HEAST = Health Effects Assessment Summary Tables

Weight of Evidence:

Known/Likely

Cannot be Determined

Not Likely

(1) For IRIS values, provide the date IRIS was searched.

For HEAST values, provide the date of HEAST.

For NCEA values, provide the date of the article provided by NCEA.

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and  
inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

400232

09/24/99

**TABLE 6.3**  
**CANCER TOXICITY DATA - SPECIAL CASE CHEMICALS**  
**HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY**

Chemical of Potential Concern	Value	Units	Source	Date (1) MM/DD/YY
N/A - Not Applicable. No Special Case Chemicals evaluated.				

- (1) For IRIS values, provide the date IRIS was searched.  
For HEAST values, provide the date of HEAST.  
For NCEA values, provide the date of the article provided by NCEA.

400233

09/24/99

TABLE 7.1 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	120	ug/kg	120	ug/kg	M	7.2E-008	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	1.4E-004
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	5.7E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	850	ug/kg	850	ug/kg	M	5.1E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.6E-003
	Aroclor-1260	720	ug/kg	720	ug/kg	M	4.3E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aluminum	14250	mg/kg	14250	mg/kg	M	8.6E-004	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	8.6E-004
	Antimony	3.4	mg/kg	3.4	mg/kg	M	2.0E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	5.1E-004
	Arsenic	53	mg/kg	53	mg/kg	M	3.2E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.1E-002
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	2.7E-007	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	2.7E-004
	Copper	433	mg/kg	433	mg/kg	M	2.6E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	6.5E-004
	Manganese	420	mg/kg	420	mg/kg	M	2.5E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.1E-003
	Nickel	108	mg/kg	108	mg/kg	M	6.5E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	3.2E-004
	Silver	30	mg/kg	30	mg/kg	M	1.8E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	3.6E-004
	Thallium	1	mg/kg	1	mg/kg	M	6.0E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	8.6E-004
	Vanadium	64	mg/kg	64	mg/kg	M	3.8E-008	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	5.5E-004
	(Total)												1.6E-002
Dermal	Dieldrin	120	ug/kg	120	ug/kg	M	1.8E-008	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	3.6E-004
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	2.0E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	850	ug/kg	850	ug/kg	M	1.8E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	6.6E-003
	Aroclor-1260	720	ug/kg	720	ug/kg	M	1.5E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aluminum	14250	mg/kg	14250	mg/kg	M	2.1E-004	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	2.1E-004
	Antimony	3.4	mg/kg	3.4	mg/kg	M	5.1E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.3E-004
	Arsenic	53	mg/kg	53	mg/kg	M	2.4E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	8.0E-003
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	6.8E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	6.8E-008
	Copper	433	mg/kg	433	mg/kg	M	6.5E-008	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.6E-004
	Manganese	420	mg/kg	420	mg/kg	M	6.3E-008	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.6E-004
	Nickel	108	mg/kg	108	mg/kg	M	1.6E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	8.1E-005
	Silver	30	mg/kg	30	mg/kg	M	4.5E-007	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	9.0E-005
	Thallium	1	mg/kg	1	mg/kg	M	1.5E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.1E-004
	Vanadium	64	mg/kg	64	mg/kg	M	9.6E-007	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	1.4E-004
	(Total)												1.9E-002
Total Hazard Index Across All Exposure Routes/Pathways													3.7E-002

- (1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated  
N/A - Not Applicable

TABLE 7.1 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	21000	ug/kg	21000	ug/kg	M	1.5E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	1.8E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	20000	ug/kg	20000	ug/kg	M	1.2E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	7.2E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenz(a,h)anthracene	2300	ug/kg	2300	ug/kg	M	1.4E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aldrin	400	ug/kg	400	ug/kg	M	2.4E-008	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	8.0E-004
	Dieldrin	740	ug/kg	740	ug/kg	M	4.4E-008	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	8.9E-004
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	5.9E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.2E-002
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	2.0E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1260	2500	ug/kg	2500	ug/kg	M	1.5E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	2,3,7,8-TCDD equiv.	0.308	ug/kg	0.308	ug/kg	M	1.8E-011	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	32	mg/kg	32	mg/kg	M	1.9E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	4.8E-003
	Arsenic	3640	mg/kg	3640	mg/kg	M	2.2E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	7.3E-001
	(Total)												7.5E-001
Dermal	Benzo(a)anthracene	21000	ug/kg	21000	ug/kg	M	4.1E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	5.9E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	20000	ug/kg	20000	ug/kg	M	3.9E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	2.3E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenz(a,h)anthracene	2300	ug/kg	2300	ug/kg	M	4.5E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aldrin	400	ug/kg	400	ug/kg	M	6.0E-008	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	2.0E-003
	Dieldrin	740	ug/kg	740	ug/kg	M	1.1E-007	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	2.2E-003
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	1.5E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.9E-002
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	7.1E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1260	2500	ug/kg	2500	ug/kg	M	5.3E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	2,3,7,8-TCDD equiv.	0.308	ug/kg	0.308	ug/kg	M	1.4E-011	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	32	mg/kg	32	mg/kg	M	4.8E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.2E-003
	Arsenic	3640	mg/kg	3640	mg/kg	M	1.6E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.5E-001
	(Total)												5.8E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.3E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation  
(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated  
N/A - Not Applicable

400235

TABLE 7.1.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	4534	ug/kg	4534	ug/kg	M	2.7E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	7841	ug/kg	7841	ug/kg	M	4.7E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	5343	ug/kg	5343	ug/kg	M	3.2E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	3251	ug/kg	3251	ug/kg	M	2.0E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	2532	ug/kg	2532	ug/kg	M	1.5E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aldrin	114	ug/kg	114	ug/kg	M	6.8E-008	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	2.3E-004
	Dieldrin	200	ug/kg	200	ug/kg	M	1.2E-008	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	2.4E-004
	Methoxychlor	72823	ug/kg	72823	ug/kg	M	4.4E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	8.7E-004
	Aroclor-1248	7359	ug/kg	7359	ug/kg	M	4.4E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1260	1500	ug/kg	1500	ug/kg	M	9.0E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	2,3,7,8-TCDD equiv.	0.15	ug/kg	0.15	ug/kg	M	9.0E-012	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Antimony	2.7	mg/kg	2.7	mg/kg	M	1.6E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	4.1E-004
	Arsenic	48	mg/kg	48	mg/kg	M	2.8E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	9.2E-003
	(Total)												1.1E-002
Dermal	Benzo(a)anthracene	4534	ug/kg	4534	ug/kg	M	8.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	7841	ug/kg	7841	ug/kg	M	1.5E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	5343	ug/kg	5343	ug/kg	M	1.0E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	3251	ug/kg	3251	ug/kg	M	6.3E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	2532	ug/kg	2532	ug/kg	M	4.9E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aldrin	114	ug/kg	114	ug/kg	M	1.7E-008	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	5.7E-004
	Dieldrin	200	ug/kg	200	ug/kg	M	3.0E-008	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	6.0E-004
	Methoxychlor	72823	ug/kg	72823	ug/kg	M	1.1E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.2E-003
	Aroclor-1248	7359	ug/kg	7359	ug/kg	M	1.5E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1260	1500	ug/kg	1500	ug/kg	M	3.2E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	2,3,7,8-TCDD equiv.	0.15	ug/kg	0.15	ug/kg	M	6.8E-012	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Antimony	2.7	mg/kg	2.7	mg/kg	M	4.1E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.0E-004
	Arsenic	48	mg/kg	48	mg/kg	M	2.1E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	6.9E-003
	(Total)												1.0E-002
Total Hazard Index Across All Exposure Routes/Pathways													2.1E-002

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

- - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

TABLE 7.1 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	1.0E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	1.7E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1488	ug/kg	1488	ug/kg	M	8.8E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	7.8E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	3.9E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	7.8E-003
	Aluminum	8432	mg/kg	8432	mg/kg	M	5.1E-004	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	5.1E-004
	Antimony	17	mg/kg	17	mg/kg	M	1.0E-006	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.6E-003
	Arsenic	24	mg/kg	24	mg/kg	M	1.4E-006	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.8E-003
	Copper	1519	mg/kg	1519	mg/kg	M	9.1E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.3E-003
	Manganese	215	mg/kg	215	mg/kg	M	1.3E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	5.4E-004
	Thallium	0.92	mg/kg	0.92	mg/kg	M	5.5E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	7.9E-004
	Vanadium	37	mg/kg	37	mg/kg	M	2.2E-006	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	3.2E-004
	(Total)												2.0E-002
Dermal	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	3.3E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	5.6E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1488	ug/kg	1488	ug/kg	M	2.9E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	2.5E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	9.8E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.0E-002
	Aluminum	8432	mg/kg	8432	mg/kg	M	1.3E-004	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.3E-004
	Antimony	17	mg/kg	17	mg/kg	M	2.8E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	6.4E-004
	Arsenic	24	mg/kg	24	mg/kg	M	1.1E-006	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.6E-003
	Copper	1519	mg/kg	1519	mg/kg	M	2.3E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	5.7E-004
	Manganese	215	mg/kg	215	mg/kg	M	3.2E-006	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.3E-004
	Thallium	0.92	mg/kg	0.92	mg/kg	M	1.4E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.0E-004
	Vanadium	37	mg/kg	37	mg/kg	M	5.6E-007	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	7.9E-005
	(Total)												2.5E-002
Total Hazard Index Across All Exposure Routes/Pathways													4.4E-002

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

400237



TABLE 7.1 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(b)fluoranthene	2800	ug/kg	2800	ug/kg	M	1.6E-007	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Benzo(a)pyrene	1800	ug/kg	1800	ug/kg	M	1.1E-007	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Hexachlorobutadiene	6800	ug/kg	6800	ug/kg	M	4.1E-007	mg/kg-day	2.0E-004	mg/kg-day	N/A	N/A	2.0E-003
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	3.4E-008	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	4.9E-004
	Aldrin	22	ug/kg	22	ug/kg	M	1.3E-008	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	4.4E-005
	Aroclor-1248	891	ug/kg	891	ug/kg	M	5.3E-008	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	1.2E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	5.6E-003
	Aroclor-1260	465	ug/kg	465	ug/kg	M	2.8E-008	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	1.2E-011	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aluminum	15500	mg/kg	15500	mg/kg	M	9.3E-004	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	9.3E-004
	Antimony	18	mg/kg	18	mg/kg	M	1.1E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.7E-003
	Arsenic	27	mg/kg	27	mg/kg	M	1.6E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.4E-003
	Cadmium	37	mg/kg	37	mg/kg	M	2.2E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	2.2E-003
	Copper	591	mg/kg	591	mg/kg	M	3.5E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	8.6E-004
	Manganese	461	mg/kg	461	mg/kg	M	2.8E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.2E-003
	Nickel	298	mg/kg	298	mg/kg	M	1.8E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	8.9E-004
	Silver	287	mg/kg	287	mg/kg	M	1.7E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	3.4E-003
	Thallium	0.72	mg/kg	0.72	mg/kg	M	4.3E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	6.2E-004
	Zinc	9172	mg/kg	9172	mg/kg	M	5.5E-004	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	1.8E-003
	(Total)												2.6E-002
Dermal	Benzo(b)fluoranthene	2800	ug/kg	2800	ug/kg	M	5.1E-007	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Benzo(a)pyrene	1800	ug/kg	1800	ug/kg	M	3.5E-007	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Hexachlorobutadiene	6800	ug/kg	6800	ug/kg	M	1.0E-008	mg/kg-day	2.0E-004	mg/kg-day	N/A	N/A	5.1E-003
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	8.8E-008	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	1.2E-003
	Aldrin	22	ug/kg	22	ug/kg	M	3.3E-008	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	1.1E-004
	Aroclor-1248	891	ug/kg	891	ug/kg	M	1.9E-007	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	4.1E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.0E-002
	Aroclor-1260	465	ug/kg	465	ug/kg	M	9.8E-008	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	9.0E-012	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aluminum	15500	mg/kg	15500	mg/kg	M	2.3E-004	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	2.3E-004
	Antimony	18	mg/kg	18	mg/kg	M	2.7E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	6.6E-004
	Arsenic	27	mg/kg	27	mg/kg	M	1.2E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.1E-003
	Cadmium	37	mg/kg	37	mg/kg	M	5.8E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	5.8E-005
	Copper	591	mg/kg	591	mg/kg	M	8.9E-008	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.2E-004
	Manganese	461	mg/kg	461	mg/kg	M	6.9E-008	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.9E-004
	Nickel	298	mg/kg	298	mg/kg	M	4.4E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	2.2E-004
	Silver	287	mg/kg	287	mg/kg	M	4.3E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	8.6E-004
	Thallium	0.72	mg/kg	0.72	mg/kg	M	1.1E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.5E-004
	Zinc	9172	mg/kg	9172	mg/kg	M	1.4E-004	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	4.6E-004
	(Total)												3.4E-002
Total Hazard Index Across All Exposure Routes/Pathways													6.3E-002

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation  
(2) Chronic.

— - Reference Dose not available, therefore Hazard Quotient not calculated.  
N/A - Not Applicable.

400238

TABLE 7.2 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	8.8E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	8.4E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	8.8E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	1.0E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenzo(a,h)anthracene	90000	ug/kg	90000	ug/kg	M	5.4E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Naphthalene	320000	ug/kg	320000	ug/kg	M	1.9E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	8.0E-004
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	8.8E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	3.3E-003
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	4.8E-005	mg/kg-day	6.0E-002	mg/kg-day	N/A	N/A	8.0E-004
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	6.0E-005	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	1.5E-002
	Fluorene	1800000	ug/kg	1800000	ug/kg	M	9.0E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.4E-003
	Fluoranthene	3600000	ug/kg	3600000	ug/kg	M	2.3E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	5.9E-003
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	1.7E-004	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	5.0E-003
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	9.0E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.0E-003
	Antimony	5.7	mg/kg	5.7	mg/kg	M	3.4E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	8.0E-004
	Arsenic	84	mg/kg	84	mg/kg	M	5.0E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.7E-002
	Copper	495	mg/kg	495	mg/kg	M	3.0E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	7.4E-004
	Manganese	495	mg/kg	495	mg/kg	M	3.0E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.2E-003
	Thallium	1.8	mg/kg	1.8	mg/kg	M	1.1E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.5E-003
	Zinc	3050	mg/kg	3050	mg/kg	M	1.0E-004	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	8.1E-004
	(Total)												5.7E-002
Dermal	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	2.1E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	2.7E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	2.1E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	5.9E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenzo(a,h)anthracene	90000	ug/kg	90000	ug/kg	M	1.0E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Naphthalene	320000	ug/kg	320000	ug/kg	M	6.2E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	3.1E-003
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	2.1E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.1E-002
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	1.0E-004	mg/kg-day	6.0E-002	mg/kg-day	N/A	N/A	2.8E-003
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	2.0E-004	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	4.9E-002
	Fluorene	1800000	ug/kg	1800000	ug/kg	M	3.1E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	7.8E-003
	Fluoranthene	3600000	ug/kg	3600000	ug/kg	M	7.6E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.9E-002
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	5.5E-004	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	1.8E-002
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	2.3E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	4.5E-003
	Antimony	5.7	mg/kg	5.7	mg/kg	M	8.8E-008	mg/kg-day	2.1E-004	mg/kg-day	N/A	N/A	2.1E-004
	Arsenic	84	mg/kg	84	mg/kg	M	3.0E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.3E-002
	Copper	495	mg/kg	495	mg/kg	M	7.4E-008	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.0E-004
	Manganese	495	mg/kg	495	mg/kg	M	7.4E-008	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	3.1E-004
	Thallium	1.8	mg/kg	1.8	mg/kg	M	2.7E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	3.9E-004
	Zinc	3050	mg/kg	3050	mg/kg	M	4.8E-005	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	1.5E-004
	(Total)												1.3E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.9E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

400239

TABLE 7.2 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 4 - ARC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Unit	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	1.8E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	9.0E-002
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	1.0E-009	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	31700	mg/kg	31700	mg/kg	M	1.9E-003	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	4.8E+000
	Arsenic	254	mg/kg	254	mg/kg	M	1.5E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.1E-002
	(Total)												4.9E+000
Dermal	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	6.3E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	3.2E-001
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	7.7E-010	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	31700	mg/kg	31700	mg/kg	M	4.8E-004	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.2E+000
	Arsenic	254	mg/kg	254	mg/kg	M	1.1E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.8E-002
	(Total)												1.5E+000
Total Hazard Index Across All Exposure Routes/Pathways													6.4E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

TABLE 7.2 CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 4 - ARC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aroclor-1254	5599	ug/kg	5599	ug/kg	M	1.7E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	8.4E-003
	2,3,7,8-TCDD equiv.	3.2	ug/kg	3.2	ug/kg	M	9.6E-011	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Antimony	9017	mg/kg	9017	mg/kg	M	2.7E-004	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	6.8E-001
	Arsenic	155	mg/kg	155	mg/kg	M	4.7E-006	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.6E-002
	(Total)												7.0E-001
Dermal	Aroclor-1254	5599	ug/kg	5599	ug/kg	M	1.2E-006	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	5.9E-002
	2,3,7,8-TCDD equiv.	3.2	ug/kg	3.2	ug/kg	M	1.4E-010	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Antimony	9017	mg/kg	9017	mg/kg	M	1.4E-004	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	3.4E-001
	Arsenic	155	mg/kg	155	mg/kg	M	7.0E-006	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.3E-002
	(Total)												4.2E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.1E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

- - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400241

TABLE 7.3 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Vinyl Chloride	0.004	mg/l	0.004	mg/l	M	1.2E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	0.01	mg/l	0.01	mg/l	M	3.0E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	7.5E-004
	Arsenic	0.0886	mg/l	0.886	mg/l	M	2.7E-006	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	9.0E-003
	Cadmium	0.0085	mg/l	0.0085	mg/l	M	2.8E-007	mg/kg-day	5.0E-004	mg/kg-day	N/A	N/A	5.1E-004
	Copper	1.23	mg/l	1.23	mg/l	M	3.7E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	9.2E-004
	Manganese	1.03	mg/l	1.03	mg/l	M	3.1E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.3E-003
	Nickel	0.144	mg/l	0.144	mg/l	M	4.3E-006	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	6.2E-002
	(Total)												7.4E-002
Dermal	Vinyl Chloride	0.004	mg/l	0.004	mg/l	M	1.8E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	0.01	mg/l	0.01	mg/l	M	5.5E-006	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.4E-005
	Arsenic	0.0886	mg/l	0.886	mg/l	M	4.8E-006	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.8E-004
	Cadmium	0.0085	mg/l	0.0085	mg/l	M	4.7E-006	mg/kg-day	5.0E-004	mg/kg-day	N/A	N/A	9.4E-006
	Copper	1.23	mg/l	1.23	mg/l	M	8.8E-007	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.7E-005
	Manganese	1.03	mg/l	1.03	mg/l	M	5.7E-007	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.4E-005
	Nickel	0.144	mg/l	0.144	mg/l	M	7.9E-006	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	3.4E-004
	(Total)												3.4E-004
Total Hazard Index Across All Exposure Routes/Pathways													7.4E-002

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

TABLE 7.3 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: ADC 2 - ADC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Vinyl Chloride	0.0088	mg/l	0.0088	mg/l	M	2.8E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	0.0088	mg/l	0.0088	mg/l	M	2.9E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	7.2E-004
	Arsenic	0.487	mg/l	0.487	mg/l	M	1.4E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.7E-002
	Manganese	0.873	mg/l	0.873	mg/l	M	2.0E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	8.4E-004
	Thallium	0.0023	mg/l	0.0023	mg/l	M	8.9E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	9.9E-004
	(Total)												4.6E-002
Dermal	Vinyl Chloride	0.0088	mg/l	0.0088	mg/l	M	3.9E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	0.0088	mg/l	0.0088	mg/l	M	5.3E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.3E-005
	Arsenic	0.487	mg/l	0.487	mg/l	M	2.8E-007	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	8.6E-004
	Manganese	0.873	mg/l	0.873	mg/l	M	3.7E-007	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.5E-005
	Thallium	0.0023	mg/l	0.0023	mg/l	M	1.3E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.8E-005
	(Total)												8.0E-004
Total Hazard Index Across All Exposure Routes/Pathways													5.0E-002

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

400243

TABLE 7.3 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 3 - SPD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Methoxychlor	0.00081	mg/l	0.00081	mg/l	M	2.7E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	5.5E-006
	Aluminum	2.81	mg/l	2.81	mg/l	M	7.8E-005	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	7.8E-005
	Arsenic	0.0089	mg/l	0.0089	mg/l	M	3.0E-007	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	9.9E-004
	Copper	0.247	mg/l	0.247	mg/l	M	7.4E-006	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.9E-004
	Manganese	0.919	mg/l	0.919	mg/l	M	2.8E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.1E-003
	Vanadium	0.0074	mg/l	0.0074	mg/l	M	2.2E-007	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	3.2E-005
	(Total)												2.4E-003
Dermal	Methoxychlor	0.00081	mg/l	0.00081	mg/l	M	8.5E-009	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.7E-008
	Aluminum	2.81	mg/l	2.81	mg/l	M	1.4E-008	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.4E-008
	Arsenic	0.0089	mg/l	0.0089	mg/l	M	5.4E-009	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.8E-005
	Copper	0.247	mg/l	0.247	mg/l	M	1.4E-007	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	3.4E-006
	Manganese	0.919	mg/l	0.919	mg/l	M	5.1E-007	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.1E-005
	Vanadium	0.0074	mg/l	0.0074	mg/l	M	4.1E-009	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	5.8E-007
	(Total)												4.8E-005
Total Hazard Index Across All Exposure Routes/Pathways													2.5E-003

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

TABLE 7.3 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 4 - ARC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Antimony	0.082	mg/l	0.082	mg/l	M	2.8E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	8.8E-003
	Arsenic	0.013	mg/l	0.013	mg/l	M	3.9E-007	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.3E-003
	Cadmium	0.0085	mg/l	0.0085	mg/l	M	2.6E-007	mg/kg-day	5.0E-004	mg/kg-day	N/A	N/A	5.1E-004
	Copper	1.23	mg/l	1.23	mg/l	M	3.7E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	9.2E-004
	Manganese	0.73	mg/l	0.73	mg/l	M	2.2E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	9.1E-004
	Nickel	0.128	mg/l	0.128	mg/l	M	3.8E-006	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.9E-004
	Silver	0.038	mg/l	0.038	mg/l	M	1.1E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.3E-004
	(Total)												1.1E-002
Dermal	Antimony	0.082	mg/l	0.082	mg/l	M	5.1E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.3E-004
	Arsenic	0.013	mg/l	0.013	mg/l	M	7.2E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.4E-005
	Cadmium	0.0085	mg/l	0.0085	mg/l	M	4.7E-008	mg/kg-day	5.0E-004	mg/kg-day	N/A	N/A	9.4E-006
	Copper	1.23	mg/l	1.23	mg/l	M	8.8E-007	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.7E-005
	Manganese	0.73	mg/l	0.73	mg/l	M	4.0E-007	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.7E-005
	Nickel	0.128	mg/l	0.128	mg/l	M	7.0E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	3.5E-007
	Silver	0.038	mg/l	0.038	mg/l	M	1.3E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.5E-006
	(Total)												2.0E-004
Total Hazard Index Across All Exposure Routes/Pathways													1.1E-002

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

400245



TABLE 7.3 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 5 - DSM  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	0.569	mg/l	0.569	mg/l	M	1.7E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.7E-002
	Manganese	1.19	mg/l	1.19	mg/l	M	3.6E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.5E-003
	(Total)												5.8E-002
Dermal	Arsenic	0.569	mg/l	0.569	mg/l	M	3.1E-007	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.0E-003
	Manganese	1.19	mg/l	1.19	mg/l	M	6.5E-007	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.7E-005
	(Total)												1.1E-003
Total Hazard Index Across All Exposure Routes/Pathways													5.9E-002

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

--- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400246

TABLE 7.3 RME

TABLE 7.3 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 6 - RR  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aluminum	2.31	mg/l	2.31	mg/l	M	8.9E-005	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	8.9E-005
	Antimony	0.0057	mg/l	0.0057	mg/l	M	1.7E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	4.3E-004
	Arsenic	0.02	mg/l	0.02	mg/l	M	6.0E-007	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.0E-003
	Copper	0.249	mg/l	0.249	mg/l	M	7.5E-008	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.9E-004
	Manganese	0.101	mg/l	0.101	mg/l	M	3.0E-008	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.3E-004
	Thallium	0.005	mg/l	0.005	mg/l	M	1.5E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.1E-003
	Vanadium	0.0188	mg/l	0.0188	mg/l	M	5.6E-007	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	8.0E-005
	(Total)												5.0E-003
Dermal	Aluminum	2.31	mg/l	2.31	mg/l	M	1.3E-008	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.3E-008
	Antimony	0.0057	mg/l	0.0057	mg/l	M	3.1E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	7.8E-008
	Arsenic	0.02	mg/l	0.02	mg/l	M	1.1E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.7E-005
	Copper	0.249	mg/l	0.249	mg/l	M	1.4E-007	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	3.4E-006
	Manganese	0.101	mg/l	0.101	mg/l	M	5.6E-008	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.3E-006
	Thallium	0.005	mg/l	0.005	mg/l	M	2.8E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	3.9E-005
	Vanadium	0.0188	mg/l	0.0188	mg/l	M	1.0E-008	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	1.5E-006
	(Total)												9.2E-005
Total Hazard Index Across All Exposure Routes/Pathways													5.1E-003

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

TABLE 7.4 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future
Medium: Surface Water
Exposure Medium: Shellfish
Exposure Point: AOC 5 - DSM
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	0.569	mg/l	25	mg/kg	R	2.2E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	7.4E-008
	Manganese	1.19	mg/l	714	mg/kg	R	6.4E-008	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.6E-008
	(Total)												1.0E-005
Total Hazard Index Across All Exposure Routes/Pathways													1.0E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

400248

TABLE 7.4 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Shellfish  
Exposure Point: AOC 6 - RR  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aluminum	2.31	mg/l	--	mg/kg	R	--	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	--
	Antimony	0.0057	mg/l	0.0057	mg/kg	R	5.1E-013	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.3E-009
	Arsenic	0.02	mg/l	0.88	mg/kg	R	7.8E-011	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.6E-007
	Copper	0.249	mg/l	49.8	mg/kg	R	4.4E-009	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.1E-007
	Manganese	0.101	mg/l	80.6	mg/kg	R	5.4E-009	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.2E-007
	Thallium	0.005	mg/l	0.17	mg/kg	R	1.5E-011	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.2E-007
	Vanadium	0.0186	mg/l	--	mg/kg	R	--	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	--
(Total)													8.1E-007
Total Hazard Index Across All Exposure Routes/Pathways													8.1E-007

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400249

TABLE 7.5 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Antimony	21.4	mg/kg	21.4	mg/kg	M	2.8E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	8.4E-003
	Arsenic	1110	mg/kg	1110	mg/kg	M	1.3E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.4E-001
	Copper	5300	mg/kg	5300	mg/kg	M	6.4E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.6E-002
	Manganese	2080	mg/kg	2080	mg/kg	M	2.5E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.0E-002
	Thallium	3.3	mg/kg	3.3	mg/kg	M	4.0E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	5.7E-003
	(Total)												4.8E-001
Dermal	Antimony	21.4	mg/kg	21.4	mg/kg	M	2.4E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	5.9E-004
	Arsenic	1110	mg/kg	1110	mg/kg	M	3.7E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.2E-001
	Copper	5300	mg/kg	5300	mg/kg	M	5.8E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.5E-003
	Manganese	2080	mg/kg	2080	mg/kg	M	2.3E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	9.5E-004
	Thallium	3.3	mg/kg	3.3	mg/kg	M	3.8E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	5.2E-004
	(Total)												1.3E-001
Total Hazard Index Across All Exposure Routes/Pathways													8.1E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

400250

TABLE 7.5 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 2 - ADC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	8002	ug/kg	8002	ug/kg	M	7.2E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Methoxychlor	640000	ug/kg	640000	ug/kg	M	7.7E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.5E-002
	Arsenic	3480	mg/kg	3480	mg/kg	M	4.2E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.4E+000
	(Total)												1.4E+000
Dermal	Benzo(a)pyrene	8002	ug/kg	8002	ug/kg	M	8.6E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Methoxychlor	640000	ug/kg	640000	ug/kg	M	7.0E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.4E-002
	Arsenic	3480	mg/kg	3480	mg/kg	M	1.1E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.8E-001
	(Total)												4.0E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.8E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400251

TABLE 7.5.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 2 - ADC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	385	ug/kg	385	ug/kg	M	4.7E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	58556	ug/kg	58556	ug/kg	M	6.8E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.4E-003
	Arsenic	688	mg/kg	688	mg/kg	M	8.0E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.7E-001
	(Total)												2.7E-001
Dermal	Benzo(a)pyrene	385	ug/kg	385	ug/kg	M	5.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	58556	ug/kg	58556	ug/kg	M	6.2E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.2E-003
	Arsenic	688	mg/kg	688	mg/kg	M	2.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	7.4E-002
	(Total)												7.5E-002
Total Hazard Index Across All Exposure Routes/Pathways													3.4E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

- - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

TABLE 7.5.RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 3 - SPD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(b)fluoranthene	910	ug/kg	910	ug/kg	M	1.1E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	630	ug/kg	630	ug/kg	M	7.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	130	ug/kg	130	ug/kg	M	1.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Arochlor 1254	68	ug/kg	68	ug/kg	M	8.2E-009	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	4.1E-004
	Heptachlor	220	ug/kg	220	ug/kg	M	2.6E-008	mg/kg-day	5.0E-004	mg/kg-day	N/A	N/A	5.3E-005
	Methoxychlor	130000	ug/kg	130000	ug/kg	M	1.6E-006	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	3.1E-003
	Aluminum	13600	mg/kg	13600	mg/kg	M	1.6E-006	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.6E-006
	Antimony	2.3	mg/kg	2.3	mg/kg	M	2.8E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	6.9E-004
	Arsenic	21.8	mg/kg	21.8	mg/kg	M	2.6E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	8.7E-003
	Copper	816	mg/kg	816	mg/kg	M	9.8E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.4E-003
	Manganese	282	mg/kg	282	mg/kg	M	3.4E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.4E-003
	Vanadium	47.9	mg/kg	47.9	mg/kg	M	5.7E-006	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	8.2E-004
	(Total)												1.8E-002
Dermal	Benzo(b)fluoranthene	910	ug/kg	910	ug/kg	M	1.3E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	630	ug/kg	630	ug/kg	M	9.0E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	130	ug/kg	130	ug/kg	M	1.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Arochlor 1254	68	ug/kg	68	ug/kg	M	1.0E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	5.2E-004
	Heptachlor	220	ug/kg	220	ug/kg	M	2.4E-008	mg/kg-day	5.0E-004	mg/kg-day	N/A	N/A	4.8E-006
	Methoxychlor	130000	ug/kg	130000	ug/kg	M	1.4E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.9E-003
	Aluminum	13600	mg/kg	13600	mg/kg	M	1.5E-004	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.5E-004
	Antimony	2.3	mg/kg	2.3	mg/kg	M	2.5E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	6.3E-006
	Arsenic	21.8	mg/kg	21.8	mg/kg	M	7.2E-007	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.4E-003
	Copper	816	mg/kg	816	mg/kg	M	9.0E-006	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.2E-004
	Manganese	282	mg/kg	282	mg/kg	M	3.1E-006	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.3E-004
	Vanadium	47.9	mg/kg	47.9	mg/kg	M	5.3E-007	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	7.5E-005
	(Total)												6.5E-003
Total Hazard Index Across All Exposure Routes/Pathways													2.4E-002

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.  
N/A - Not Applicable.



TABLE 7.5 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timescale: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 4 - ARC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	1000	ug/kg	1000	ug/kg	M	1.2E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dieldrin	41	ug/kg	41	ug/kg	M	4.9E-008	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	9.8E-005
	Aroclor-1248	2100	ug/kg	2100	ug/kg	M	2.5E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	57500	ug/kg	57500	ug/kg	M	8.9E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	3.5E-001
	Aroclor-1260	2100	ug/kg	2100	ug/kg	M	2.5E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	2,3,7,8-TCDD equiv	0.08	ug/kg	0.08	ug/kg	M	9.8E-012	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	26	mg/kg	26	mg/kg	M	3.1E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	7.8E-003
	Arsenic	49	mg/kg	49	mg/kg	M	5.9E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.0E-002
	Copper	1493	mg/kg	1493	mg/kg	M	1.8E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	4.5E-003
	Silver	321	mg/kg	321	mg/kg	M	3.9E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	7.7E-003
	(Total)												3.8E-001
Dermal	Benzo(a)pyrene	1000	ug/kg	1000	ug/kg	M	1.4E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dieldrin	41	ug/kg	41	ug/kg	M	4.5E-008	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	9.0E-005
	Aroclor-1248	2100	ug/kg	2100	ug/kg	M	3.2E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	57500	ug/kg	57500	ug/kg	M	8.9E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	4.4E-001
	Aroclor-1260	2100	ug/kg	2100	ug/kg	M	3.2E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	2,3,7,8-TCDD equiv	0.08	ug/kg	0.08	ug/kg	M	2.8E-012	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	26	mg/kg	26	mg/kg	M	2.9E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	7.2E-004
	Arsenic	49	mg/kg	49	mg/kg	M	1.6E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.4E-003
	Copper	1493	mg/kg	1493	mg/kg	M	1.6E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	4.1E-004
	Silver	321	mg/kg	321	mg/kg	M	3.5E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	7.1E-004
	(Total)												4.5E-001
Total Hazard Index Across All Exposure Routes/Pathways													8.3E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

TABLE 7.5 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 5 - DBM  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	3.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	8.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	300	ug/kg	300	ug/kg	M	3.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	2.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	470	ug/kg	470	ug/kg	M	5.6E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.8E-003
	Arsenic	4030	mg/kg	4030	mg/kg	M	4.8E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.6E+000
	(Total)												1.6E+000
Dermal	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	4.3E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	1.0E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	300	ug/kg	300	ug/kg	M	4.3E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	3.1E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	470	ug/kg	470	ug/kg	M	7.2E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	3.8E-003
	Arsenic	4030	mg/kg	4030	ug/kg	M	1.3E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.4E-001
	(Total)												4.5E-001
Total Hazard Index Across All Exposure Routes/Pathways													2.1E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated  
N/A - Not Applicable

400255

TABLE 7.5.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 5 - DSM  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	5.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	407	ug/kg	407	ug/kg	M	4.9E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	3.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	2.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	387	ug/kg	387	ug/kg	M	4.6E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.3E-003
	Arsenic	1917	mg/kg	1917	mg/kg	M	2.3E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	7.7E-001
	(Total)												7.7E-001
Dermal	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	4.3E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	407	ug/kg	407	ug/kg	M	5.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	4.3E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	3.1E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	387	ug/kg	387	ug/kg	M	6.0E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	3.0E-003
	Arsenic	1917	mg/kg	1917	ug/kg	M	6.3E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.1E-001
	(Total)												2.1E-001
Total Hazard Index Across All Exposure Routes/Pathways													9.6E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

- - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

TABLE 7.5 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 8 - RR  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	2200	mg/kg	2200	mg/kg	M	2.8E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	8.8E-001
	Copper	3580	mg/kg	3580	mg/kg	M	4.3E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.1E-002
	(Total)												8.9E-001
Dermal	Arsenic	2200	mg/kg	2200	mg/kg	M	7.3E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.4E-001
	Copper	3580	mg/kg	3580	mg/kg	M	3.9E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	9.8E-004
	(Total)												2.4E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.1E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400257

TABLE 7.5.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 8 - RR  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	450	mg/kg	450	mg/kg	M	5.4E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.8E-001
	Copper	1573	mg/kg	1573	mg/kg	M	1.0E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	4.7E-003
	(Total)												1.8E-001
Dermal	Arsenic	450	mg/kg	450	mg/kg	M	1.5E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.0E-002
	Copper	1573	mg/kg	1573	mg/kg	M	1.7E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	4.3E-004
	(Total)												5.0E-002
Total Hazard Index Across All Exposure Routes/Pathways													2.3E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400258

TABLE 7 6a RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	120	ug/kg	120	ug/kg	M	5.8E-008	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	1.2E-003
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	4.7E-008	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aroclor-1254	850	ug/kg	850	ug/kg	M	4.2E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.1E-002
	Aroclor-1260	720	ug/kg	720	ug/kg	M	3.5E-007	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aluminum	14250	mg/kg	14250	mg/kg	M	7.0E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	7.0E-003
	Antimony	3.4	mg/kg	3.4	mg/kg	M	1.7E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	4.2E-003
	Arsenic	53	mg/kg	53	mg/kg	M	2.8E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	8.7E-002
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	2.2E-006	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	2.2E-003
	Copper	433	mg/kg	433	mg/kg	M	2.1E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	5.3E-003
	Manganese	420	mg/kg	420	mg/kg	M	2.1E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	8.6E-003
	Nickel	108	mg/kg	108	mg/kg	M	5.3E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	2.6E-003
	Silver	30	mg/kg	30	mg/kg	M	1.5E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.9E-003
	Thallium	1	mg/kg	1	mg/kg	M	4.9E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	7.0E-003
	Vanadium	64	mg/kg	64	mg/kg	M	3.1E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	4.5E-003
	(Total)												1.5E-001
Dermal	Dieldrin	120	ug/kg	120	ug/kg	M	8.8E-007	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	1.4E-002
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	7.6E-005	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aroclor-1254	850	ug/kg	850	ug/kg	M	6.8E-006	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	3.4E-001
	Aroclor-1260	720	ug/kg	720	ug/kg	M	5.7E-006	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aluminum	14250	mg/kg	14250	mg/kg	M	8.1E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	8.1E-003
	Antimony	3.4	mg/kg	3.4	mg/kg	M	1.9E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	4.8E-003
	Arsenic	53	mg/kg	53	mg/kg	M	9.1E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.0E-001
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	2.8E-007	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	2.8E-004
	Copper	433	mg/kg	433	mg/kg	M	2.5E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	6.2E-003
	Manganese	420	mg/kg	420	mg/kg	M	2.4E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.0E-002
	Nickel	108	mg/kg	108	mg/kg	M	6.2E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	3.1E-003
	Silver	30	mg/kg	30	mg/kg	M	1.7E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	3.4E-003
	Thallium	1	mg/kg	1	mg/kg	M	5.7E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	8.1E-003
	Vanadium	64	mg/kg	64	mg/kg	M	3.8E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	5.2E-003
	(Total)												7.0E-001
Total Hazard Index Across All Exposure Routes/Pathways													8.6E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

— Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

TABLE 7 6a RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: ADC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	21000	ug/kg	21000	ug/kg	M	1.0E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	1.5E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(e)pyrene	20000	ug/kg	20000	ug/kg	M	9.8E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	5.9E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenzo(a,h)anthracene	2300	ug/kg	2300	ug/kg	M	1.1E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aldrin	400	ug/kg	400	ug/kg	M	2.0E-007	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	6.5E-003
	Dieldrin	740	ug/kg	740	ug/kg	M	3.8E-007	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	7.3E-003
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	4.8E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	9.8E-002
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	1.7E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1260	2500	ug/kg	2500	ug/kg	M	1.2E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	2,3,7,8-TCDD equiv.	0.308	ug/kg	0.308	ug/kg	M	1.5E-010	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	32	mg/kg	32	mg/kg	M	1.8E-005	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	3.9E-002
	Arsenic	3640	mg/kg	3640	mg/kg	M	1.8E-003	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.9E+000
	(Total)												8.1E+000
Dermal	Benzo(a)anthracene	21000	ug/kg	21000	ug/kg	M	1.8E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	2.2E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(e)pyrene	20000	ug/kg	20000	ug/kg	M	1.5E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	8.9E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenzo(a,h)anthracene	2300	ug/kg	2300	ug/kg	M	1.7E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aldrin	400	ug/kg	400	ug/kg	M	2.3E-006	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	7.6E-002
	Dieldrin	740	ug/kg	740	ug/kg	M	4.2E-006	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	8.4E-002
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	5.8E-003	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.1E+000
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	2.7E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1260	2500	ug/kg	2500	ug/kg	M	2.0E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	2,3,7,8-TCDD equiv.	0.308	ug/kg	0.308	ug/kg	M	5.3E-010	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	32	mg/kg	32	mg/kg	M	1.8E-005	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	4.8E-002
	Arsenic	3640	mg/kg	3640	mg/kg	M	6.2E-003	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.1E+001
	(Total)												2.2E+001
Total Hazard Index Across All Exposure Routes/Pathways													2.8E+001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.  
N/A - Not Applicable

TABLE 7.6a CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	4534	ug/kg	4534	ug/kg	M	9.1E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	7841	ug/kg	7841	ug/kg	M	1.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	5343	ug/kg	5343	ug/kg	M	1.1E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	3251	ug/kg	3251	ug/kg	M	8.5E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	2532	ug/kg	2532	ug/kg	M	5.1E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aldrin	114	ug/kg	114	ug/kg	M	2.3E-008	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	7.6E-004
	Dieldrin	200	ug/kg	200	ug/kg	M	4.0E-008	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	8.0E-004
	Methoxychlor	72623	ug/kg	72623	ug/kg	M	1.5E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.9E-003
	Aroclor-1248	7358	ug/kg	7358	ug/kg	M	1.5E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1260	1500	ug/kg	1500	ug/kg	M	3.0E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	2,3,7,8-TCDD equiv.	0.15	ug/kg	0.15	ug/kg	M	3.0E-011	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Antimony	2.7	mg/kg	2.7	mg/kg	M	5.4E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.4E-003
	Arsenic	48	mg/kg	48	mg/kg	M	9.2E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.1E-002
	(Total)												3.8E-002
Dermal	Benzo(a)anthracene	4534	ug/kg	4534	ug/kg	M	2.1E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	7841	ug/kg	7841	ug/kg	M	3.7E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	5343	ug/kg	5343	ug/kg	M	2.5E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	3251	ug/kg	3251	ug/kg	M	1.5E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	2532	ug/kg	2532	ug/kg	M	1.2E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aldrin	114	ug/kg	114	ug/kg	M	4.1E-007	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	1.4E-002
	Dieldrin	200	ug/kg	200	ug/kg	M	7.2E-007	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	1.4E-002
	Methoxychlor	72623	ug/kg	72623	ug/kg	M	2.8E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	5.2E-002
	Aroclor-1248	7358	ug/kg	7358	ug/kg	M	3.7E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1260	1500	ug/kg	1500	ug/kg	M	7.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	2,3,7,8-TCDD equiv.	0.15	ug/kg	0.15	ug/kg	M	1.6E-010	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Antimony	2.7	mg/kg	2.7	mg/kg	M	9.7E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.4E-003
	Arsenic	48	mg/kg	48	mg/kg	M	5.0E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.7E-001
	(Total)												2.5E-001
Total Hazard Index Across All Exposure Routes/Pathways													2.9E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.



TABLE 7.6a RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	8.3E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	1.4E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1488	ug/kg	1488	ug/kg	M	7.2E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	6.4E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	3.2E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	6.4E-002
	Aluminum	8432	mg/kg	8432	mg/kg	M	4.1E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	4.1E-003
	Arsimony	17	mg/kg	17	mg/kg	M	8.3E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.1E-002
	Arsenic	24	mg/kg	24	mg/kg	M	1.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.9E-002
	Copper	1519	mg/kg	1519	mg/kg	M	7.4E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.9E-002
	Manganese	215	mg/kg	215	mg/kg	M	1.1E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	4.4E-003
	Thallium	0.92	mg/kg	0.92	mg/kg	M	4.5E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	6.4E-003
	Vanadium	37	mg/kg	37	mg/kg	M	1.8E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	2.6E-003
	(Total)												1.8E-001
Dermal	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	1.3E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	2.1E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1488	ug/kg	1488	ug/kg	M	1.1E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	9.6E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	3.7E-003	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	7.4E-001
	Aluminum	8432	mg/kg	8432	mg/kg	M	4.8E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	4.8E-003
	Arsimony	17	mg/kg	17	mg/kg	M	9.7E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.4E-002
	Arsenic	24	mg/kg	24	mg/kg	M	4.1E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.4E-001
	Copper	1519	mg/kg	1519	mg/kg	M	8.7E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.2E-002
	Manganese	215	mg/kg	215	mg/kg	M	1.2E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	5.1E-003
	Thallium	0.92	mg/kg	0.92	mg/kg	M	5.2E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	7.5E-003
	Vanadium	37	mg/kg	37	mg/kg	M	2.1E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	3.0E-003
	(Total)												9.4E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.1E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

TABLE 7.8a RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(b)fluoranthene	2600	ug/kg	2600	ug/kg	M	1.3E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1800	ug/kg	1800	ug/kg	M	8.8E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Hexachlorobutadiene	6800	ug/kg	6800	ug/kg	M	3.3E-006	mg/kg-day	2.0E-004	mg/kg-day	N/A	N/A	1.7E-002
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	2.8E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	4.0E-003
	Aldrin	22	ug/kg	22	ug/kg	M	1.1E-006	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	3.8E-004
	Aroclor-1248	891	ug/kg	891	ug/kg	M	4.4E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	9.5E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	4.8E-002
	Aroclor-1260	465	ug/kg	465	ug/kg	M	2.3E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	9.8E-011	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aluminum	15500	mg/kg	15500	mg/kg	M	7.8E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	7.8E-003
	Antimony	18	mg/kg	18	mg/kg	M	8.8E-006	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.2E-002
	Arsenic	27	mg/kg	27	mg/kg	M	1.3E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.4E-002
	Cadmium	37	mg/kg	37	mg/kg	M	1.8E-005	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	1.8E-002
	Copper	591	mg/kg	591	mg/kg	M	2.9E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	7.2E-003
	Manganese	461	mg/kg	461	mg/kg	M	2.3E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	9.4E-003
	Nickel	296	mg/kg	296	mg/kg	M	1.5E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	7.3E-003
	Silver	287	mg/kg	287	mg/kg	M	1.4E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.8E-002
	Thallium	0.72	mg/kg	0.72	mg/kg	M	3.5E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	5.0E-003
	Zinc	9172	mg/kg	9172	mg/kg	M	4.5E-003	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	1.5E-002
	(Total)												2.3E-001
Dermal	Benzo(b)fluoranthene	2600	ug/kg	2600	ug/kg	M	1.9E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1800	ug/kg	1800	ug/kg	M	1.3E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Hexachlorobutadiene	6800	ug/kg	6800	ug/kg	M	3.9E-005	mg/kg-day	2.0E-004	mg/kg-day	N/A	N/A	1.9E-001
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	3.3E-004	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	4.7E-002
	Aldrin	22	ug/kg	22	ug/kg	M	1.3E-007	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	4.2E-003
	Aroclor-1248	891	ug/kg	891	ug/kg	M	7.1E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	1.5E-005	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	7.7E-001
	Aroclor-1260	465	ug/kg	465	ug/kg	M	3.7E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	3.4E-010	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aluminum	15500	mg/kg	15500	mg/kg	M	8.8E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	8.8E-003
	Antimony	18	mg/kg	18	mg/kg	M	1.0E-005	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.6E-002
	Arsenic	27	mg/kg	27	mg/kg	M	4.6E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.5E-001
	Cadmium	37	mg/kg	37	mg/kg	M	2.1E-006	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	2.1E-003
	Copper	591	mg/kg	591	mg/kg	M	3.4E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	8.4E-003
	Manganese	461	mg/kg	461	mg/kg	M	2.8E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.1E-002
	Nickel	296	mg/kg	296	mg/kg	M	1.7E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	8.4E-003
	Silver	287	mg/kg	287	mg/kg	M	1.6E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	3.3E-002
	Thallium	0.72	mg/kg	0.72	mg/kg	M	4.1E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	5.9E-003
	Zinc	9172	mg/kg	9172	mg/kg	M	5.2E-003	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	1.7E-002
	(Total)												1.3E+000
Total Hazard Index Across All Exposure Routes/Pathways													1.5E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

TABLE 7.6a CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(b)fluoranthene	1664	ug/kg	1664	ug/kg	M	3.4E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	1640	ug/kg	1640	ug/kg	M	3.3E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Hexachlorobutadiene	1879	ug/kg	1879	ug/kg	M	3.8E-007	mg/kg-day	2.0E-004	mg/kg-day	N/A	N/A	1.0E-003
	Hexachlorocyclopentadiene	848	ug/kg	848	ug/kg	M	1.7E-007	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	2.4E-005
	Aldrin	1.6	ug/kg	1.6	ug/kg	M	3.2E-010	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	1.1E-005
	Aroclor-1248	43	ug/kg	43	ug/kg	M	8.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	62	ug/kg	62	ug/kg	M	1.2E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	6.2E-004
	Aroclor-1260	44	ug/kg	44	ug/kg	M	8.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	2,3,7,8-TCDD equiv.	0.12	ug/kg	0.12	ug/kg	M	2.4E-011	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aluminum	6618	mg/kg	6618	mg/kg	M	1.4E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.4E-003
	Antimony	3.5	mg/kg	3.5	mg/kg	M	7.0E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.8E-003
	Arsenic	9.7	mg/kg	9.7	mg/kg	M	1.9E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	6.5E-003
	Cadmium	1.3	mg/kg	1.3	mg/kg	M	2.6E-007	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	2.6E-004
	Copper	174	mg/kg	174	mg/kg	M	3.5E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	8.7E-004
	Manganese	123	mg/kg	123	mg/kg	M	2.5E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.0E-003
	Nickel	21	mg/kg	21	mg/kg	M	4.2E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	2.1E-004
	Silver	66	mg/kg	66	mg/kg	M	1.3E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.6E-003
	Thallium	0.53	mg/kg	0.53	mg/kg	M	1.1E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.9E-003
	Zinc	108	mg/kg	108	mg/kg	M	2.2E-005	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	7.2E-005
	(Total)												1.6E-002
Dermal	Benzo(b)fluoranthene	1664	ug/kg	1664	ug/kg	M	7.9E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	1640	ug/kg	1640	ug/kg	M	7.7E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Hexachlorobutadiene	1879	ug/kg	1879	ug/kg	M	6.8E-008	mg/kg-day	2.0E-004	mg/kg-day	N/A	N/A	3.4E-002
	Hexachlorocyclopentadiene	848	ug/kg	848	ug/kg	M	3.0E-008	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	4.4E-004
	Aldrin	1.6	ug/kg	1.6	ug/kg	M	5.8E-009	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	1.9E-004
	Aroclor-1248	43	ug/kg	43	ug/kg	M	2.2E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	62	ug/kg	62	ug/kg	M	3.1E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.6E-002
	Aroclor-1260	44	ug/kg	44	ug/kg	M	2.2E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	2,3,7,8-TCDD equiv.	0.12	ug/kg	0.12	ug/kg	M	1.3E-010	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aluminum	6618	mg/kg	6618	mg/kg	M	2.5E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	2.5E-003
	Antimony	3.5	mg/kg	3.5	mg/kg	M	1.3E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	3.2E-003
	Arsenic	9.7	mg/kg	9.7	mg/kg	M	1.0E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.5E-002
	Cadmium	1.3	mg/kg	1.3	mg/kg	M	4.7E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	4.7E-005
	Copper	174	mg/kg	174	mg/kg	M	6.3E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.6E-003
	Manganese	123	mg/kg	123	mg/kg	M	4.4E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.8E-003
	Nickel	21	mg/kg	21	mg/kg	M	7.6E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	3.8E-004
	Silver	66	mg/kg	66	mg/kg	M	2.4E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	4.8E-003
	Thallium	0.53	mg/kg	0.53	mg/kg	M	1.6E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.7E-003
	Zinc	108	mg/kg	108	mg/kg	M	3.9E-005	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	1.3E-004
	(Total)												1.0E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.2E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

TABLE 7.6b RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aroclor-1248	1300	ug/kg	1300	ug/kg	M	6.4E-007	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aroclor-1254	96	ug/kg	96	ug/kg	M	4.7E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.4E-003
	Aroclor-1260	3100	ug/kg	3100	ug/kg	M	1.5E-008	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aluminum	10685	mg/kg	10685	mg/kg	M	5.2E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	5.2E-003
	Antimony	5.1	mg/kg	5.1	mg/kg	M	2.5E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	6.2E-003
	Arsenic	24.5	mg/kg	24.5	mg/kg	M	1.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.0E-002
	Cadmium	4.4	mg/kg	4.4	mg/kg	M	2.2E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	2.2E-003
	Copper	1222	mg/kg	1222	mg/kg	M	6.0E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.5E-002
	Manganese	486	mg/kg	486	mg/kg	M	2.4E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	9.9E-003
	Nickel	174	mg/kg	174	mg/kg	M	8.6E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	4.3E-003
	Thallium	2.5	mg/kg	2.5	mg/kg	M	1.2E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.8E-002
	Vanadium	50	mg/kg	50	mg/kg	M	2.5E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	3.5E-003
	(Total)												1.1E-001
Dermal	Aroclor-1248	1300	ug/kg	1300	ug/kg	M	1.0E-005	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aroclor-1254	96	ug/kg	96	ug/kg	M	7.7E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	3.8E-002
	Aroclor-1260	3100	ug/kg	3100	ug/kg	M	2.6E-005	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Aluminum	10685	mg/kg	10685	mg/kg	M	6.1E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	6.1E-003
	Antimony	5.1	mg/kg	5.1	mg/kg	M	2.0E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	7.3E-003
	Arsenic	24.5	mg/kg	24.5	mg/kg	M	4.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.4E-001
	Cadmium	4.4	mg/kg	4.4	mg/kg	M	2.5E-007	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	2.5E-004
	Copper	1222	mg/kg	1222	mg/kg	M	7.0E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.7E-002
	Manganese	486	mg/kg	486	mg/kg	M	2.8E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.2E-002
	Nickel	174	mg/kg	174	mg/kg	M	9.9E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	5.0E-003
	Thallium	2.5	mg/kg	2.5	mg/kg	M	1.4E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.0E-002
	Vanadium	50	mg/kg	50	mg/kg	M	2.9E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	4.1E-003
	(Total)												2.5E-001
Total Hazard Index Across All Exposure Routes/Pathways													3.6E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

— - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

TABLE 7.65.RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	1348	ug/kg	1348	ug/kg	M	8.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	41000	ug/kg	41000	ug/kg	M	2.0E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	6200	ug/kg	6200	ug/kg	M	3.0E-006	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.5E-001
	Artimony	1308	mg/kg	1308	mg/kg	M	6.4E-004	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.6E+000
	Arsenic	707	mg/kg	707	mg/kg	M	3.5E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.2E+000
	(Total)												2.9E+000
Dermal	Benzo(a)pyrene	1348	ug/kg	1348	ug/kg	M	1.0E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	41000	ug/kg	41000	ug/kg	M	3.3E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	6200	ug/kg	6200	ug/kg	M	4.9E-005	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.5E+000
	Artimony	1308	mg/kg	1308	mg/kg	M	7.5E-004	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.8E+000
	Arsenic	707	mg/kg	707	mg/kg	M	1.2E-003	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.0E+000
	(Total)												8.4E+000
Total Hazard Index Across All Exposure Routes/Pathways													1.1E+001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

TABLE 7.6b.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	184	ug/kg	184	ug/kg	M	3.7E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	3882	ug/kg	3882	ug/kg	M	7.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	1105	ug/kg	1105	ug/kg	M	2.2E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.1E-002
	Artimony	3.2	mg/kg	3.2	mg/kg	M	8.4E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.8E-003
	Arsenic	33	mg/kg	33	mg/kg	M	8.8E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.2E-002
	(Total)												3.5E-002
Dermal	Benzo(a)pyrene	184	ug/kg	184	ug/kg	M	8.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	3882	ug/kg	3882	ug/kg	M	2.0E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	1105	ug/kg	1105	ug/kg	M	5.8E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.8E-001
	Artimony	3.2	mg/kg	3.2	mg/kg	M	1.2E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.9E-003
	Arsenic	33	mg/kg	33	mg/kg	M	3.8E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.2E-001
	(Total)												4.0E-001
Total Hazard Index Across All Exposure Routes/Pathways													4.3E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.  
N/A - Not Applicable.

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TABLE 7.6b RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	1,2-Dichloroethane	360000	ug/kg	360000	ug/kg	M	1.6E-004	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	6.4E-003
	Benzo(b)fluoranthene	3149	ug/kg	3149	ug/kg	M	1.5E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	4713	ug/kg	4713	ug/kg	M	2.3E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	760000	ug/kg	760000	ug/kg	M	3.7E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	7.4E-002
	Aroclor-1242	10638	ug/kg	10638	ug/kg	M	5.2E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	74000	ug/kg	74000	ug/kg	M	3.6E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Arsenic	828	mg/kg	828	mg/kg	M	4.1E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.4E+000
	Thallium	1.8	mg/kg	1.8	mg/kg	M	8.8E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.3E-002
	(Total)												1.4E+000
Dermal	1,2-Dichloroethane	360000	ug/kg	360000	ug/kg	M	2.2E-002	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	7.4E-001
	Benzo(b)fluoranthene	3149	ug/kg	3149	ug/kg	M	2.3E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	4713	ug/kg	4713	ug/kg	M	3.5E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	760000	ug/kg	760000	ug/kg	M	4.3E-003	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	8.7E-001
	Aroclor-1242	10638	ug/kg	10638	ug/kg	M	8.4E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	74000	ug/kg	74000	ug/kg	M	5.9E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Arsenic	828	mg/kg	828	mg/kg	M	1.4E-003	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.7E+000
	Thallium	1.8	mg/kg	1.8	mg/kg	M	1.0E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.5E-002
	(Total)												8.3E+000
Total Hazard Index Across All Exposure Routes/Pathways													7.8E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

- - Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

TABLE 7.6b.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	1,2-Dichloroethane	28073	ug/kg	28073	ug/kg	M	5.2E-008	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	1.7E-004
	Benzo(b)fluoranthene	490	ug/kg	490	ug/kg	M	9.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	563	ug/kg	563	ug/kg	M	1.1E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	64833	ug/kg	64833	ug/kg	M	1.3E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.8E-003
	Aroclor-1242	78.8	ug/kg	78.8	ug/kg	M	1.5E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	7281	ug/kg	7281	ug/kg	M	1.5E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Arsenic	21	mg/kg	21	mg/kg	M	4.2E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.4E-002
	Thallium	1	mg/kg	1	mg/kg	M	2.0E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.9E-003
	(Total)												2.0E-002
Dermal	1,2-Dichloroethane	28073	ug/kg	28073	ug/kg	M	9.4E-004	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	3.1E-002
	Benzo(b)fluoranthene	490	ug/kg	490	ug/kg	M	2.3E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	563	ug/kg	563	ug/kg	M	2.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	64833	ug/kg	64833	ug/kg	M	2.3E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	4.7E-002
	Aroclor-1242	78.8	ug/kg	78.8	ug/kg	M	3.9E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	7281	ug/kg	7281	ug/kg	M	3.7E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Arsenic	21	mg/kg	21	mg/kg	M	2.3E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	7.8E-002
	Thallium	1	mg/kg	1	mg/kg	M	3.8E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	5.1E-003
	(Total)												1.8E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.8E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

- - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.



TABLE 7.6b.RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVIEW, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	93	ug/kg	93	ug/kg	M	4.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	164	ug/kg	164	ug/kg	M	8.0E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	4.0E-003
	Aroclor-1260	178	ug/kg	178	ug/kg	M	8.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	18000	ug/kg	18000	ug/kg	M	8.8E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.8E-003
	Aluminum	9082	mg/kg	9082	mg/kg	M	4.5E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	4.5E-003
	Antimony	0.83	mg/kg	0.83	mg/kg	M	4.1E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.0E-003
	Arsenic	29	mg/kg	29	mg/kg	M	1.4E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.7E-002
	Cadmium	0.67	mg/kg	0.67	mg/kg	M	3.3E-007	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	3.3E-004
	Manganese	197	mg/kg	197	mg/kg	M	9.7E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	4.0E-003
	Thallium	1.2	mg/kg	1.2	mg/kg	M	5.9E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	8.4E-003
	Vanadium	33	mg/kg	33	mg/kg	M	1.6E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	2.3E-003
	(Total)												7.4E-002
Dermal	Benzo(a)pyrene	93	ug/kg	93	ug/kg	M	6.9E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	164	ug/kg	164	ug/kg	M	1.3E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	6.5E-002
	Aroclor-1260	178	ug/kg	178	ug/kg	M	1.4E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	18000	ug/kg	18000	ug/kg	M	1.0E-004	mg/kg-day	6.0E-003	mg/kg-day	N/A	N/A	2.1E-002
	Aluminum	9082	mg/kg	9082	mg/kg	M	5.2E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	5.2E-003
	Antimony	0.83	mg/kg	0.83	mg/kg	M	4.7E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.2E-003
	Arsenic	29	mg/kg	29	mg/kg	M	5.0E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.7E-001
	Cadmium	0.67	mg/kg	0.67	mg/kg	M	3.8E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	3.8E-005
	Manganese	197	mg/kg	197	mg/kg	M	1.1E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	4.7E-003
	Thallium	1.2	mg/kg	1.2	mg/kg	M	6.8E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	9.8E-003
	Vanadium	33	mg/kg	33	mg/kg	M	1.9E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	2.7E-003
	(Total)												2.7E-001
Total Hazard Index Across All Exposure Routes/Pathways													3.5E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

TABLE 7.6b RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Test Pit Soil
Exposure Point: AOC 3 - SPD
Receptor Population: Site Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Hexachloroethane	10,201,148	ug/kg	10,201,148	ug/kg	M	5.0E-003	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	5.0E+000
	Benzo(a)pyrene	4700	ug/kg	4700	ug/kg	M	2.3E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenzo(a,h)anthracene	920	ug/kg	920	ug/kg	M	4.5E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1248	21000	ug/kg	21000	ug/kg	M	1.0E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	6000	ug/kg	6000	ug/kg	M	2.9E-006	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.5E-001
	Arsenic	77	mg/kg	77	mg/kg	M	3.8E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.3E-001
	Copper	32300	mg/kg	32300	mg/kg	M	1.6E-002	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	4.0E-001
	(Total)												5.7E+000
Dermal	Hexachloroethane	10,201,148	ug/kg	10,201,148	ug/kg	M	5.8E-002	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	5.8E+001
	Benzo(a)pyrene	4700	ug/kg	4700	ug/kg	M	3.5E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenzo(a,h)anthracene	920	ug/kg	920	ug/kg	M	6.8E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1248	21000	ug/kg	21000	ug/kg	M	1.7E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	6000	ug/kg	6000	ug/kg	M	4.8E-005	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.4E+000
	Arsenic	77	mg/kg	77	mg/kg	M	1.3E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.4E-001
	Copper	32300	mg/kg	32300	mg/kg	M	1.8E-002	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	4.6E-001
	(Total)												6.1E+001
Total Hazard Index Across All Exposure Routes/Pathways													6.7E+001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

400271

TABLE 7.6b.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Hexachlorobenzene	1751	ug/kg	1751	ug/kg	M	3.5E-007	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	3.5E-004
	Benzo(a)pyrene	2000	ug/kg	2000	ug/kg	M	4.0E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	920	ug/kg	920	ug/kg	M	1.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Acroclor-1248	3331	ug/kg	3331	ug/kg	M	6.7E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Acroclor-1254	784	ug/kg	784	ug/kg	M	1.5E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	7.6E-003
	Arsenic	21.5	mg/kg	21.5	mg/kg	M	4.3E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.4E-002
	Copper	3502	mg/kg	3502	mg/kg	M	7.0E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.8E-002
	(Total)												4.0E-002
Dermal	Hexachlorobenzene	1751	ug/kg	1751	ug/kg	M	6.3E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	6.3E-003
	Benzo(a)pyrene	2000	ug/kg	2000	ug/kg	M	9.4E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	920	ug/kg	920	ug/kg	M	4.3E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Acroclor-1248	3331	ug/kg	3331	ug/kg	M	1.7E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Acroclor-1254	784	ug/kg	784	ug/kg	M	3.9E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.9E-001
	Arsenic	21.5	mg/kg	21.5	mg/kg	M	2.3E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	7.7E-002
	Copper	3502	mg/kg	3502	mg/kg	M	1.3E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	3.2E-001
	(Total)												3.1E-001
Total Hazard Index Across All Exposure Routes/Pathways													3.5E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400272

TABLE 7.8b RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Tetrachloroethene	19252	ug/kg	19252	ug/kg	M	9.4E-008	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	9.4E-004
	Chlorobenzene	29736	ug/kg	29736	ug/kg	M	1.5E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	7.3E-004
	Benzo(a)anthracene	793	ug/kg	793	ug/kg	M	3.9E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	830	ug/kg	830	ug/kg	M	4.1E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	767	ug/kg	767	ug/kg	M	3.8E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	893	ug/kg	893	ug/kg	M	3.4E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	1,2,4-Trichlorobenzene	112687	ug/kg	112687	ug/kg	M	5.5E-005	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	5.5E-003
	Aldrin	5.7	ug/kg	5.7	ug/kg	M	2.8E-009	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	9.3E-005
	Aroclor-1248	149	ug/kg	149	ug/kg	M	7.3E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	56	ug/kg	56	ug/kg	M	2.7E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.4E-003
	Aluminum	13018	mg/kg	13018	mg/kg	M	6.4E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	6.4E-003
	Antimony	2.1	mg/kg	2.1	mg/kg	M	1.0E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.6E-003
	Arsenic	13	mg/kg	13	mg/kg	M	6.4E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.1E-002
	Manganese	133	mg/kg	133	mg/kg	M	6.5E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.7E-003
	Thallium	1.1	mg/kg	1.1	mg/kg	M	5.4E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	7.7E-003
	Vanadium	43	mg/kg	43	mg/kg	M	2.1E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	3.0E-003
	(Total)												5.2E-002
Dermal	Tetrachloroethene	19252	ug/kg	19252	ug/kg	M	1.1E-003	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	1.1E-001
	Chlorobenzene	29736	ug/kg	29736	ug/kg	M	1.7E-003	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	8.5E-002
	Benzo(a)anthracene	793	ug/kg	793	ug/kg	M	5.9E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	830	ug/kg	830	ug/kg	M	6.2E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	767	ug/kg	767	ug/kg	M	5.7E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	893	ug/kg	893	ug/kg	M	5.1E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	1,2,4-Trichlorobenzene	112687	ug/kg	112687	ug/kg	M	6.4E-004	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	6.4E-002
	Aldrin	5.7	ug/kg	5.7	ug/kg	M	3.2E-008	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	1.1E-003
	Aroclor-1248	149	ug/kg	149	ug/kg	M	1.2E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	56	ug/kg	56	ug/kg	M	4.5E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.2E-002
	Aluminum	13018	mg/kg	13018	mg/kg	M	7.4E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	7.4E-003
	Antimony	2.1	mg/kg	2.1	mg/kg	M	1.2E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	3.0E-003
	Arsenic	13	mg/kg	13	mg/kg	M	2.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	7.4E-002
	Manganese	133	mg/kg	133	mg/kg	M	7.8E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	3.2E-003
	Thallium	1.1	mg/kg	1.1	mg/kg	M	6.3E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	9.0E-003
	Vanadium	43	mg/kg	43	mg/kg	M	2.5E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	3.5E-003
	(Total)												5.8E-001
Total Hazard Index Across All Exposure Routes/Pathways													4.3E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

TABLE 7.7a RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium Soil  
Exposure Medium: Surface Soil  
Exposure Point: ADC 1 - HRDD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Dieldrin	120	ug/kg	120	ug/kg	M	1.4E-007	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	2.6E-003
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	1.1E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	850	ug/kg	850	ug/kg	M	1.0E-006	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	5.1E-002
	Aroclor-1260	720	ug/kg	720	ug/kg	M	8.6E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aluminum	14250	mg/kg	14250	mg/kg	M	1.7E-002	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.7E-002
	Antimony	3.4	mg/kg	3.4	mg/kg	M	4.1E-006	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.0E-002
	Arsenic	53	mg/kg	53	mg/kg	M	6.4E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.1E-001
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	5.4E-006	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	5.4E-003
	Copper	433	mg/kg	433	mg/kg	M	5.2E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.3E-002
	Manganese	420	mg/kg	420	mg/kg	M	5.0E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.1E-002
	Nickel	108	mg/kg	108	mg/kg	M	1.3E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	6.5E-003
	Silver	30	mg/kg	30	mg/kg	M	3.6E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	7.2E-003
	Thallium	1	mg/kg	1	mg/kg	M	1.2E-006	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.7E-002
	Vanadium	64	mg/kg	64	mg/kg	M	7.7E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	1.1E-002
	(Total)												3.7E-001
Dermal	Dieldrin	120	ug/kg	120	ug/kg	M	1.9E-007	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	3.6E-003
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	2.1E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	850	ug/kg	850	ug/kg	M	1.9E-006	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	9.5E-002
	Aroclor-1260	720	ug/kg	720	ug/kg	M	1.6E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aluminum	14250	mg/kg	14250	mg/kg	M	2.3E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	2.3E-003
	Antimony	3.4	mg/kg	3.4	mg/kg	M	5.4E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.4E-003
	Arsenic	53	mg/kg	53	mg/kg	M	2.5E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	8.5E-002
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	7.2E-006	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	7.2E-005
	Copper	433	mg/kg	433	mg/kg	M	6.9E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.7E-003
	Manganese	420	mg/kg	420	mg/kg	M	6.7E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.6E-003
	Nickel	108	mg/kg	108	mg/kg	M	1.7E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	8.6E-004
	Silver	30	mg/kg	30	mg/kg	M	4.8E-006	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	9.6E-004
	Thallium	1	mg/kg	1	mg/kg	M	1.6E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.3E-003
	Vanadium	64	mg/kg	64	mg/kg	M	1.0E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	1.5E-003
	(Total)												2.0E-001
Total Hazard Index Across All Exposure Routes/Pathways													5.7E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

TABLE 7.7a RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benz(a)anthracene	21000	ug/kg	21000	ug/kg	M	2.5E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benz(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	3.6E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benz(a)pyrene	20000	ug/kg	20000	ug/kg	M	2.4E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	1.4E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenz(a,h)anthracene	2300	ug/kg	2300	ug/kg	M	2.8E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aldrin	400	ug/kg	400	ug/kg	M	4.8E-007	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	1.6E-002
	Dieldrin	740	ug/kg	740	ug/kg	M	8.9E-007	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	1.8E-002
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	1.2E-003	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.4E-001
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	4.1E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1260	2500	ug/kg	2500	ug/kg	M	3.0E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	2,3,7,8-TCDD equiv	0.308	ug/kg	0.308	ug/kg	M	3.7E-010	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	32	mg/kg	32	mg/kg	M	3.8E-005	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	9.8E-002
	Arsenic	3640	mg/kg	3640	mg/kg	M	4.4E-003	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.5E+001
	(Total)												1.5E+001
Dermal	Benz(a)anthracene	21000	ug/kg	21000	ug/kg	M	4.4E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benz(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	6.2E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benz(a)pyrene	20000	ug/kg	20000	ug/kg	M	4.2E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	2.5E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenz(a,h)anthracene	2300	ug/kg	2300	ug/kg	M	4.8E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aldrin	400	ug/kg	400	ug/kg	M	6.4E-007	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	2.1E-002
	Dieldrin	740	ug/kg	740	ug/kg	M	1.2E-006	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	2.4E-002
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	2.2E-003	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	4.4E-001
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	7.6E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1260	2500	ug/kg	2500	ug/kg	M	4.0E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	2,3,7,8-TCDD equiv	0.308	ug/kg	0.308	ug/kg	M	1.5E-010	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	32	mg/kg	32	mg/kg	M	5.1E-006	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.3E-002
	Arsenic	3640	mg/kg	3640	mg/kg	M	1.7E-003	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.8E+000
	(Total)												8.3E+000
Total Hazard Index Across All Exposure Routes/Pathways													2.1E+001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

TABLE 7.7a.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 2 - AOC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	4534	ug/kg	4534	ug/kg	M	5.4E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	7841	ug/kg	7841	ug/kg	M	9.4E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	5343	ug/kg	5343	ug/kg	M	6.4E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	3251	ug/kg	3251	ug/kg	M	3.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	2532	ug/kg	2532	ug/kg	M	3.0E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aldrin	114	ug/kg	114	ug/kg	M	1.4E-007	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	4.8E-003
	Dieldrin	200	ug/kg	200	ug/kg	M	2.4E-007	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	4.8E-003
	Methoxychlor	72823	ug/kg	72823	ug/kg	M	8.7E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.7E-002
	Aroclor-1248	7358	ug/kg	7358	ug/kg	M	8.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1260	1500	ug/kg	1500	ug/kg	M	1.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	2,3,7,8-TCDD equiv.	0.15	ug/kg	0.15	ug/kg	M	1.8E-010	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Antimony	2.7	mg/kg	2.7	mg/kg	M	3.2E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	8.1E-003
	Arsenic	46	mg/kg	46	mg/kg	M	5.5E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.8E-001
	(Total)												2.2E-001
Dermal	Benzo(a)anthracene	4534	ug/kg	4534	ug/kg	M	9.4E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	7841	ug/kg	7841	ug/kg	M	1.6E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	5343	ug/kg	5343	ug/kg	M	1.1E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	3251	ug/kg	3251	ug/kg	M	6.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	2532	ug/kg	2532	ug/kg	M	5.3E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aldrin	114	ug/kg	114	ug/kg	M	1.8E-007	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	8.1E-003
	Dieldrin	200	ug/kg	200	ug/kg	M	3.2E-007	mg/kg-day	5.0E-005	mg/kg-day	N/A	N/A	8.4E-003
	Methoxychlor	72823	ug/kg	72823	ug/kg	M	1.6E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	3.3E-002
	Aroclor-1248	7358	ug/kg	7358	ug/kg	M	1.6E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1260	1500	ug/kg	1500	ug/kg	M	2.4E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	2,3,7,8-TCDD equiv.	0.15	ug/kg	0.15	ug/kg	M	7.2E-011	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Antimony	2.7	mg/kg	2.7	mg/kg	M	4.3E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.1E-003
	Arsenic	46	mg/kg	46	mg/kg	M	2.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	7.4E-002
	(Total)												1.2E-001
Total Hazard Index Across All Exposure Routes/Pathways													3.4E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Chronic.

- - Reference Dose not available, therefore Hazard Quotient not calculated.  
N/A - Not Applicable.

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TABLE 7.8 CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	468143	ug/kg	468143	ug/kg	M	3.0E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	3.5E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	428620	ug/kg	428620	ug/kg	M	2.8E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	9.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	2.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Naphthalene	100888	ug/kg	100888	ug/kg	M	6.6E-008	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	3.3E-004
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	3.2E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.8E-003
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	2.3E-005	mg/kg-day	6.0E-002	mg/kg-day	N/A	N/A	3.9E-004
	Dibenzofuran	388113	ug/kg	388113	ug/kg	M	2.6E-005	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	8.5E-003
	Fluorene	563383	ug/kg	563383	ug/kg	M	3.8E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	9.5E-004
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	1.2E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	3.0E-003
	Pyrene	1411478	ug/kg	1411478	ug/kg	M	9.2E-005	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	3.1E-003
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	2.5E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	4.9E-004
	Arsimony	3.7	mg/kg	3.7	mg/kg	M	2.4E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	6.0E-004
	Arsenic	46	mg/kg	46	mg/kg	M	3.0E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.0E-002
	Copper	253	mg/kg	253	mg/kg	M	1.8E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	4.1E-004
	Manganese	239	mg/kg	239	mg/kg	M	1.8E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	6.5E-004
	Thallium	0.9	mg/kg	0.9	mg/kg	M	5.9E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	8.4E-004
	Zinc	981	mg/kg	981	mg/kg	M	8.4E-005	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	2.1E-004
	(Total)												2.8E-002
Dermal	Benzo(a)anthracene	468143	ug/kg	468143	ug/kg	M	7.9E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	9.1E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	428620	ug/kg	428620	ug/kg	M	7.2E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	2.5E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	7.2E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Naphthalene	100888	ug/kg	100888	ug/kg	M	1.7E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	8.5E-003
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	8.4E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	4.2E-002
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	6.0E-004	mg/kg-day	6.0E-002	mg/kg-day	N/A	N/A	1.0E-002
	Dibenzofuran	388113	ug/kg	388113	ug/kg	M	8.7E-004	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	1.7E-001
	Fluorene	563383	ug/kg	563383	ug/kg	M	9.9E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.5E-002
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	3.1E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	7.7E-002
	Pyrene	1411478	ug/kg	1411478	ug/kg	M	2.4E-003	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	8.0E-002
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	4.8E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	9.8E-003
	Arsimony	3.7	mg/kg	3.7	mg/kg	M	4.8E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.2E-003
	Arsenic	46	mg/kg	46	mg/kg	M	1.8E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	6.0E-002
	Copper	253	mg/kg	253	mg/kg	M	3.3E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	8.2E-004
	Manganese	239	mg/kg	239	mg/kg	M	3.1E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.3E-003
	Thallium	0.9	mg/kg	0.9	mg/kg	M	1.2E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.7E-003
	Zinc	981	mg/kg	981	mg/kg	M	1.3E-004	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	4.3E-004
	(Total)												4.9E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.  
N/A - Not Applicable.

Total Hazard Index Across All Exposure Routes/Pathways

5.1E-001

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TABLE 7.7a RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	2.0E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	3.5E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1468	ug/kg	1468	ug/kg	M	1.8E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	1.6E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	7.8E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.6E-001
	Aluminum	8432	mg/kg	8432	mg/kg	M	1.0E-002	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.0E-002
	Antimony	17	mg/kg	17	mg/kg	M	2.0E-005	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	5.1E-002
	Arsenic	24	mg/kg	24	mg/kg	M	2.9E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	9.6E-002
	Copper	1519	mg/kg	1519	mg/kg	M	1.8E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	4.6E-002
	Manganese	215	mg/kg	215	mg/kg	M	2.6E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.1E-002
	Thallium	0.82	mg/kg	0.82	mg/kg	M	1.1E-006	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.6E-002
	Vanadium	37	mg/kg	37	mg/kg	M	4.4E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	6.3E-003
	(Total)												3.6E-001
Dermal	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	3.5E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	6.0E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1468	ug/kg	1468	ug/kg	M	3.1E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	2.7E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	1.0E-003	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.1E-001
	Aluminum	8432	mg/kg	8432	mg/kg	M	1.3E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.3E-003
	Antimony	17	mg/kg	17	mg/kg	M	2.7E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	6.8E-003
	Arsenic	24	mg/kg	24	mg/kg	M	1.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.8E-002
	Copper	1519	mg/kg	1519	mg/kg	M	2.4E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	6.1E-003
	Manganese	215	mg/kg	215	mg/kg	M	3.4E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.4E-003
	Thallium	0.82	mg/kg	0.82	mg/kg	M	1.5E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.1E-003
	Vanadium	37	mg/kg	37	mg/kg	M	5.9E-008	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	8.5E-004
	(Total)												2.7E-001
Total Hazard Index Across All Exposure Routes/Pathways													8.6E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

TABLE 7.7a RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(b)fluoranthene	2600	ug/kg	2600	ug/kg	M	3.1E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	1800	ug/kg	1800	ug/kg	M	2.2E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Hexachlorobutadiene	8800	ug/kg	8800	ug/kg	M	8.2E-006	mg/kg-day	2.0E-004	mg/kg-day	N/A	N/A	4.1E-002
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	6.9E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	9.8E-003
	Aldrin	22	ug/kg	22	ug/kg	M	2.6E-006	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	8.8E-004
	Aroclor-1248	891	ug/kg	891	ug/kg	M	1.1E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	2.3E-006	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.2E-001
	Aroclor-1260	465	ug/kg	465	ug/kg	M	5.6E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	2.4E-010	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aluminum	15500	mg/kg	15500	mg/kg	M	1.9E-002	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.9E-002
	Antimony	18	mg/kg	18	mg/kg	M	2.2E-005	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	5.4E-002
	Arsenic	27	mg/kg	27	mg/kg	M	3.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.1E-001
	Cadmium	37	mg/kg	37	mg/kg	M	4.4E-005	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	4.4E-002
	Copper	591	mg/kg	591	mg/kg	M	7.1E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.8E-002
	Manganese	461	mg/kg	461	mg/kg	M	5.5E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.3E-002
	Nickel	298	mg/kg	298	mg/kg	M	3.6E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.8E-002
	Silver	287	mg/kg	287	mg/kg	M	3.4E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	6.9E-002
	Thallium	0.72	mg/kg	0.72	mg/kg	M	8.6E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.2E-002
	Zinc	9172	mg/kg	9172	mg/kg	M	1.1E-002	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	3.7E-002
	(Total)												5.7E-001
Dermal	Benzo(b)fluoranthene	2600	ug/kg	2600	ug/kg	M	5.4E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	1800	ug/kg	1800	ug/kg	M	3.7E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Hexachlorobutadiene	8800	ug/kg	8800	ug/kg	M	1.1E-005	mg/kg-day	2.0E-004	mg/kg-day	N/A	N/A	5.4E-002
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	9.2E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	1.3E-002
	Aldrin	22	ug/kg	22	ug/kg	M	3.5E-006	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	1.2E-003
	Aroclor-1248	891	ug/kg	891	ug/kg	M	2.0E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	4.3E-006	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.2E-001
	Aroclor-1260	465	ug/kg	465	ug/kg	M	1.0E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	9.6E-011	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aluminum	15500	mg/kg	15500	mg/kg	M	2.5E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	2.5E-003
	Antimony	18	mg/kg	18	mg/kg	M	2.9E-006	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	7.2E-003
	Arsenic	27	mg/kg	27	mg/kg	M	1.3E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.3E-002
	Cadmium	37	mg/kg	37	mg/kg	M	5.9E-007	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	5.9E-004
	Copper	591	mg/kg	591	mg/kg	M	9.5E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.4E-003
	Manganese	461	mg/kg	461	mg/kg	M	7.4E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	3.1E-003
	Nickel	298	mg/kg	298	mg/kg	M	4.7E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	2.4E-003
	Silver	287	mg/kg	287	mg/kg	M	4.6E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	9.2E-003
	Thallium	0.72	mg/kg	0.72	mg/kg	M	1.2E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.6E-003
	Zinc	9172	mg/kg	9172	mg/kg	M	1.5E-003	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	4.9E-003
	(Total)												9.3E-001

Total Hazard Index Across All Exposure Routes/Pathways

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

400279

TABLE 7.7b RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aroclor-1248	1300	ug/kg	1300	ug/kg	M	1.6E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	98	ug/kg	98	ug/kg	M	1.2E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	5.8E-003
	Aroclor-1260	3100	ug/kg	3100	ug/kg	M	3.7E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aluminum	10685	mg/kg	10685	mg/kg	M	1.3E-002	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.3E-002
	Antimony	5.1	mg/kg	5.1	mg/kg	M	6.1E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.5E-002
	Arsenic	24.5	mg/kg	24.5	mg/kg	M	2.9E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	9.8E-002
	Cadmium	4.4	mg/kg	4.4	mg/kg	M	5.3E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	5.3E-003
	Copper	1222	mg/kg	1222	mg/kg	M	1.5E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	3.7E-002
	Manganese	486	mg/kg	486	mg/kg	M	5.8E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.4E-002
	Nickel	174	mg/kg	174	mg/kg	M	2.1E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.0E-002
	Thallium	2.5	mg/kg	2.5	mg/kg	M	3.0E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	4.3E-002
	Vanadium	50	mg/kg	50	mg/kg	M	6.0E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	8.6E-003
	(Total)												2.8E-001
Dermal	Aroclor-1248	1300	ug/kg	1300	ug/kg	M	2.9E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	98	ug/kg	98	ug/kg	M	2.2E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.1E-002
	Aroclor-1260	3100	ug/kg	3100	ug/kg	M	6.9E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aluminum	10685	mg/kg	10685	mg/kg	M	1.7E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.7E-003
	Antimony	5.1	mg/kg	5.1	mg/kg	M	6.2E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.0E-003
	Arsenic	24.5	mg/kg	24.5	mg/kg	M	1.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.9E-002
	Cadmium	4.4	mg/kg	4.4	mg/kg	M	7.0E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	7.0E-005
	Copper	1222	mg/kg	1222	mg/kg	M	2.0E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	4.9E-003
	Manganese	486	mg/kg	486	mg/kg	M	7.8E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	3.2E-003
	Nickel	174	mg/kg	174	mg/kg	M	2.8E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.4E-003
	Thallium	2.5	mg/kg	2.5	mg/kg	M	4.0E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	5.7E-003
	Vanadium	50	mg/kg	50	mg/kg	M	8.0E-008	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	1.1E-003
	(Total)												7.0E-002
Total Hazard Index Across All Exposure Routes/Pathways													3.3E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

TABLE 7.7b.RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	1348	ug/kg	1348	ug/kg	M	1.8E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	41000	ug/kg	41000	ug/kg	M	4.8E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	8200	ug/kg	8200	ug/kg	M	7.4E-006	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	3.7E-001
	Antimony	1308	mg/kg	1308	mg/kg	M	1.8E-003	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	3.9E+000
	Arsenic	707	mg/kg	707	mg/kg	M	8.5E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.8E+000
	(Total)												7.1E+000
Dermal	Benzo(a)pyrene	1348	ug/kg	1348	ug/kg	M	2.8E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	41000	ug/kg	41000	ug/kg	M	9.2E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	8200	ug/kg	8200	ug/kg	M	1.4E-005	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	6.9E-001
	Antimony	1308	mg/kg	1308	mg/kg	M	2.1E-004	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	5.2E-001
	Arsenic	707	mg/kg	707	mg/kg	M	3.4E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.1E+000
	(Total)												2.3E+000
Total Hazard Index Across All Exposure Routes/Pathways													9.5E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.  
(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.  
N/A - Not Applicable.

TABLE 7.7b CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test PR Soil  
Exposure Point: AOC 1 - HRDO  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	184	ug/kg	184	ug/kg	M	2.2E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	3682	ug/kg	3682	ug/kg	M	4.7E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	1105	ug/kg	1105	ug/kg	M	1.3E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	8.6E-002
	Artimony	3.2	mg/kg	3.2	mg/kg	M	3.8E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	9.6E-003
	Arsenic	33	mg/kg	33	mg/kg	M	4.0E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.3E-001
	(Total)												2.1E-001
Dermal	Benzo(a)pyrene	184	ug/kg	184	ug/kg	M	3.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	3682	ug/kg	3682	ug/kg	M	6.7E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	1105	ug/kg	1105	ug/kg	M	2.5E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.2E-001
	Artimony	3.2	mg/kg	3.2	mg/kg	M	5.1E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.3E-003
	Arsenic	33	mg/kg	33	mg/kg	M	1.6E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.3E-002
	(Total)												1.6E-001
Total Hazard Index Across All Exposure Routes/Pathways													3.9E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

- - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400282

TABLE 7.7b RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	1,2-Dichloroethane	360000	ug/kg	360000	ug/kg	M	4.7E-004	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	1.6E-002
	Benzo(b)fluoranthene	3149	ug/kg	3149	ug/kg	M	3.6E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	4713	ug/kg	4713	ug/kg	M	5.7E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Methoxychlor	760000	ug/kg	760000	ug/kg	M	9.1E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.8E-001
	Aroclor-1242	10538	ug/kg	10538	ug/kg	M	1.3E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1248	74000	ug/kg	74000	ug/kg	M	8.9E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Arsenic	828	mg/kg	828	mg/kg	M	9.9E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.3E+000
	Thallium	1.8	mg/kg	1.8	mg/kg	M	2.2E-006	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	3.1E-002
	(Total)												3.5E+000
Dermal	1,2-Dichloroethane	360000	ug/kg	360000	ug/kg	M	6.2E-003	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	2.1E-001
	Benzo(b)fluoranthene	3149	ug/kg	3149	ug/kg	M	6.5E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	4713	ug/kg	4713	ug/kg	M	9.6E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Methoxychlor	760000	ug/kg	760000	ug/kg	M	1.2E-003	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.4E-001
	Aroclor-1242	10538	ug/kg	10538	ug/kg	M	2.4E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1248	74000	ug/kg	74000	ug/kg	M	1.7E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Arsenic	828	mg/kg	828	mg/kg	M	4.0E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.3E+000
	Thallium	1.8	mg/kg	1.8	mg/kg	M	2.9E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	4.1E-003
	(Total)												1.6E+000
Total Hazard Index Across All Exposure Routes/Pathways													5.3E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation  
(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

400283

TABLE 7.7b CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	1,2-Dichloroethane	28703	ug/kg	28703	ug/kg	M	3.2E-005	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	1.1E-003
	Benzo(b)fluoranthene	490	ug/kg	490	ug/kg	M	5.9E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	563	ug/kg	563	ug/kg	M	6.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	64833	ug/kg	64833	ug/kg	M	7.8E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.6E-002
	Aroclor-1242	76.8	ug/kg	76.8	ug/kg	M	9.2E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	7261	ug/kg	7261	ug/kg	M	8.7E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Arsenic	21	mg/kg	21	mg/kg	M	2.5E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	8.4E-002
	Thallium	1	mg/kg	1	mg/kg	M	1.2E-006	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.7E-002
	(Total)												1.2E-001
Dermal	1,2-Dichloroethane	28703	ug/kg	28703	ug/kg	M	4.3E-004	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	1.4E-002
	Benzo(b)fluoranthene	490	ug/kg	490	ug/kg	M	1.0E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	563	ug/kg	563	ug/kg	M	1.2E-006	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	64833	ug/kg	64833	ug/kg	M	1.0E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.1E-002
	Aroclor-1242	76.8	ug/kg	76.8	ug/kg	M	1.7E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1248	7261	ug/kg	7261	ug/kg	M	1.6E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Arsenic	21	mg/kg	21	mg/kg	M	1.0E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.4E-002
	Thallium	1	mg/kg	1	mg/kg	M	1.6E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.3E-003
	(Total)												7.1E-002
Total Hazard Index Across All Exposure Routes/Pathways													1.9E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

- - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

TABLE 7.7b RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	93	ug/kg	93	ug/kg	M	1.1E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	184	ug/kg	184	ug/kg	M	2.0E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	9.8E-003
	Aroclor-1260	178	ug/kg	178	ug/kg	M	2.1E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	18000	ug/kg	18000	ug/kg	M	2.2E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	4.3E-003
	Aluminum	9062	mg/kg	9062	mg/kg	M	1.1E-002	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.1E-002
	Antimony	0.83	mg/kg	0.83	mg/kg	M	1.0E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.5E-003
	Arsenic	29	mg/kg	29	mg/kg	M	3.5E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.2E-001
	Cadmium	0.87	mg/kg	0.87	mg/kg	M	8.0E-007	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	8.0E-004
	Manganese	197	mg/kg	197	mg/kg	M	2.4E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	9.9E-003
	Thallium	1.2	mg/kg	1.2	mg/kg	M	1.4E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.1E-002
	Vanadium	33	mg/kg	33	mg/kg	M	4.0E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	5.7E-003
	(Total)												1.8E-001
Dermal	Benzo(a)pyrene	93	ug/kg	93	ug/kg	M	1.9E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	184	ug/kg	184	ug/kg	M	3.7E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.8E-002
	Aroclor-1260	178	ug/kg	178	ug/kg	M	3.9E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Methoxychlor	18000	ug/kg	18000	ug/kg	M	2.9E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	5.8E-003
	Aluminum	9062	mg/kg	9062	mg/kg	M	1.5E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.5E-003
	Antimony	0.83	mg/kg	0.83	mg/kg	M	1.3E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	3.3E-004
	Arsenic	29	mg/kg	29	mg/kg	M	1.4E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.6E-002
	Cadmium	0.87	mg/kg	0.87	mg/kg	M	1.1E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	1.1E-005
	Manganese	197	mg/kg	197	mg/kg	M	3.2E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.3E-003
	Thallium	1.2	mg/kg	1.2	mg/kg	M	1.9E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.7E-003
	Vanadium	33	mg/kg	33	mg/kg	M	5.3E-008	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	7.7E-002
	(Total)												7.7E-002
Total Hazard Index Across All Exposure Routes/Pathways													2.8E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

- - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.



TABLE 7.7b RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Hexachloroethane	10,201,148	ug/kg	10,201,148	ug/kg	M	1.2E-002	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	1.2E+001
	Benzo(a)pyrene	4700	ug/kg	4700	ug/kg	M	5.8E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenzo(a,h)anthracene	920	ug/kg	920	ug/kg	M	1.1E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1248	21000	ug/kg	21000	ug/kg	M	2.5E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	8000	ug/kg	8000	ug/kg	M	7.2E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	3.6E-001
	Arsenic	77	mg/kg	77	mg/kg	M	9.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.1E-001
	Copper	32300	mg/kg	32300	mg/kg	M	3.9E-002	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	9.7E-001
	(Total)												1.4E+001
Dermal	Hexachloroethane	10,201,148	ug/kg	10,201,148	ug/kg	M	1.8E-002	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	1.8E+001
	Benzo(a)pyrene	4700	ug/kg	4700	ug/kg	M	9.8E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenzo(a,h)anthracene	920	ug/kg	920	ug/kg	M	1.9E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1248	21000	ug/kg	21000	ug/kg	M	4.7E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	8000	ug/kg	8000	ug/kg	M	1.3E-005	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	6.7E-001
	Arsenic	77	mg/kg	77	mg/kg	M	3.7E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.2E-001
	Copper	32300	mg/kg	32300	mg/kg	M	5.2E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.3E-001
	(Total)												1.7E+001
Total Hazard Index Across All Exposure Routes/Pathways													3.1E+001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

TABLE 7.7b.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 3 - SPO  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Hexachloroethane	1751	ug/kg	1751	ug/kg	M	2.1E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	2.1E-003
	Benzo(a)pyrene	2000	ug/kg	2000	ug/kg	M	2.4E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	920	ug/kg	920	ug/kg	M	1.1E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Acroder-1248	3331	ug/kg	3331	ug/kg	M	4.0E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Acroder-1254	784	ug/kg	784	ug/kg	M	9.2E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	4.6E-002
	Arsenic	21.5	mg/kg	21.5	mg/kg	M	2.8E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	8.8E-002
	Copper	3502	mg/kg	3502	mg/kg	M	4.2E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.1E-001
	(Total)												2.4E-001
Dermal	Hexachloroethane	1751	ug/kg	1751	ug/kg	M	2.8E-008	mg/kg-day	1.0E-003	mg/kg-day	N/A	N/A	2.8E-003
	Benzo(a)pyrene	2000	ug/kg	2000	ug/kg	M	4.2E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenz(a,h)anthracene	920	ug/kg	920	ug/kg	M	1.9E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Acroder-1248	3331	ug/kg	3331	ug/kg	M	7.5E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Acroder-1254	784	ug/kg	784	ug/kg	M	1.7E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	8.8E-002
	Arsenic	21.5	mg/kg	21.5	mg/kg	M	1.0E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.4E-002
	Copper	3502	mg/kg	3502	mg/kg	M	5.6E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.4E-002
	(Total)												1.4E-001
Total Hazard Index Across All Exposure Routes/Pathways													3.8E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

NA - Not Applicable

TABLE 7.7b RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Tetrachloroethene	19252	ug/kg	19252	ug/kg	M	2.3E-005	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	2.3E-003
	Chlorobenzene	29736	ug/kg	29736	ug/kg	M	3.6E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.8E-003
	Benzo(a)anthracene	793	ug/kg	793	ug/kg	M	9.5E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	830	ug/kg	830	ug/kg	M	1.0E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	767	ug/kg	767	ug/kg	M	9.2E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	693	ug/kg	693	ug/kg	M	8.3E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	1,2,4-Trichlorobenzene	112687	ug/kg	112687	ug/kg	M	1.4E-004	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	1.4E-002
	Aldrin	5.7	ug/kg	5.7	ug/kg	M	8.8E-009	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	2.3E-004
	Aroclor-1248	149	ug/kg	149	ug/kg	M	1.8E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	56	ug/kg	56	ug/kg	M	6.7E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	3.4E-003
	Aluminum	13018	mg/kg	13018	mg/kg	M	1.6E-002	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.6E-002
	Antimony	2.1	mg/kg	2.1	mg/kg	M	2.5E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	6.3E-003
	Arsenic	13	mg/kg	13	mg/kg	M	1.6E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.2E-002
	Manganese	133	mg/kg	133	mg/kg	M	1.6E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	6.7E-003
	Thallium	1.1	mg/kg	1.1	mg/kg	M	1.3E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.9E-002
	Vanadium	43	mg/kg	43	mg/kg	M	5.2E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	7.4E-003
	(Total)												1.3E-001
Dermal	Tetrachloroethene	19252	ug/kg	19252	ug/kg	M	3.1E-004	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	3.1E-002
	Chlorobenzene	29736	ug/kg	29736	ug/kg	M	4.8E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	2.4E-002
	Benzo(a)anthracene	793	ug/kg	793	ug/kg	M	1.6E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	830	ug/kg	830	ug/kg	M	1.7E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	767	ug/kg	767	ug/kg	M	1.8E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	693	ug/kg	693	ug/kg	M	1.4E-006	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	1,2,4-Trichlorobenzene	112687	ug/kg	112687	ug/kg	M	1.8E-004	mg/kg-day	1.0E-002	mg/kg-day	N/A	N/A	1.8E-002
	Aldrin	5.7	ug/kg	5.7	ug/kg	M	9.1E-009	mg/kg-day	3.0E-005	mg/kg-day	N/A	N/A	3.0E-004
	Aroclor-1248	149	ug/kg	149	ug/kg	M	3.3E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	56	ug/kg	56	ug/kg	M	1.3E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	6.3E-003
	Aluminum	13018	mg/kg	13018	mg/kg	M	2.1E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	2.1E-003
	Antimony	2.1	mg/kg	2.1	mg/kg	M	3.4E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	8.4E-004
	Arsenic	13	mg/kg	13	mg/kg	M	6.2E-006	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.1E-002
	Manganese	133	mg/kg	133	mg/kg	M	2.1E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	8.9E-004
	Thallium	1.1	mg/kg	1.1	mg/kg	M	1.8E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.5E-003
	Vanadium	43	mg/kg	43	mg/kg	M	6.9E-006	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	9.8E-004
	(Total)												1.1E-001
Total Hazard Index Across All Exposure Routes/Pathways													2.4E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

TABLE 7.8 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	5.4E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	6.9E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	5.4E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	1.5E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenzo(a,h)anthracene	80000	ug/kg	80000	ug/kg	M	4.4E-005	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Naphthalene	320000	ug/kg	320000	ug/kg	M	1.6E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	7.9E-003
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	5.4E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	2.7E-002
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	3.9E-004	mg/kg-day	6.0E-002	mg/kg-day	N/A	N/A	6.5E-003
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	4.9E-004	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	1.2E-001
	Fluorene	1800000	ug/kg	1800000	ug/kg	M	7.8E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.0E-002
	Fluoranthene	3600000	ug/kg	3600000	ug/kg	M	1.9E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	4.8E-002
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	1.4E-003	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	4.8E-002
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	7.4E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.5E-002
	Antimony	5.7	mg/kg	5.7	mg/kg	M	2.8E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	7.0E-003
	Arsenic	84	mg/kg	84	mg/kg	M	4.1E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.4E-001
	Copper	495	mg/kg	495	mg/kg	M	2.4E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	6.1E-003
	Manganese	495	mg/kg	495	mg/kg	M	2.4E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.0E-002
	Thallium	1.8	mg/kg	1.8	mg/kg	M	8.8E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.3E-002
	Zinc	3050	mg/kg	3050	mg/kg	M	1.5E-003	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	5.0E-003
	(Total)												4.7E-001
Dermal	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	8.2E-003	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	1.0E-002	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	8.2E-003	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	2.2E-003	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Dibenzo(a,h)anthracene	80000	ug/kg	80000	ug/kg	M	6.7E-004	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Naphthalene	320000	ug/kg	320000	ug/kg	M	2.4E-003	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.2E-001
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	8.2E-003	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	4.1E-001
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	5.9E-003	mg/kg-day	6.0E-002	mg/kg-day	N/A	N/A	9.9E-002
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	7.4E-003	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	1.9E+000
	Fluorene	1800000	ug/kg	1800000	ug/kg	M	1.2E-002	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	3.0E-001
	Fluoranthene	3600000	ug/kg	3600000	ug/kg	M	2.9E-002	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	7.2E-001
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	2.1E-002	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	8.9E-001
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	8.6E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.7E-001
	Antimony	5.7	mg/kg	5.7	mg/kg	M	3.2E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	8.1E-003
	Arsenic	84	mg/kg	84	mg/kg	M	1.4E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.8E-001
	Copper	495	mg/kg	495	mg/kg	M	2.8E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	7.1E-003
	Manganese	495	mg/kg	495	mg/kg	M	2.8E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.2E-002
	Thallium	1.8	mg/kg	1.8	mg/kg	M	1.0E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.5E-002
	Zinc	3050	mg/kg	3050	mg/kg	M	1.7E-003	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	5.9E-003
	(Total)												4.9E+000
Total Hazard Index Across All Exposure Routes/Pathways													5.4E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

400289

TABLE 7.8 CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	488143	ug/kg	488143	ug/kg	M	9.4E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	9.7E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	426820	ug/kg	426820	ug/kg	M	8.5E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	3.0E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	8.5E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Naphthalene	100988	ug/kg	100988	ug/kg	M	2.0E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.0E-003
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	1.0E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	5.0E-003
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	7.1E-005	mg/kg-day	8.0E-002	mg/kg-day	N/A	N/A	1.2E-003
	Dibenzofuran	368113	ug/kg	368113	ug/kg	M	8.0E-005	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	2.0E-002
	Fluorene	583363	ug/kg	583363	ug/kg	M	1.2E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.9E-003
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	3.7E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	9.2E-003
	Pyrene	1411478	ug/kg	1411478	ug/kg	M	2.8E-004	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	9.4E-003
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	7.5E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	1.5E-003
	Antimony	3.7	mg/kg	3.7	mg/kg	M	7.4E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.9E-003
	Arsenic	48	mg/kg	48	mg/kg	M	9.2E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.1E-002
	Copper	253	mg/kg	253	mg/kg	M	5.1E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.3E-003
	Manganese	239	mg/kg	239	mg/kg	M	4.8E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.0E-003
	Thallium	0.9	mg/kg	0.9	mg/kg	M	1.8E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	2.8E-003
	Zinc	981	mg/kg	981	mg/kg	M	2.0E-004	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	6.5E-004
	(Total)												8.8E-002
Dermal	Benzo(a)anthracene	488143	ug/kg	488143	ug/kg	M	2.2E-003	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	2.5E-003	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	426820	ug/kg	426820	ug/kg	M	2.0E-003	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	6.9E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	2.0E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Naphthalene	100988	ug/kg	100988	ug/kg	M	4.7E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	2.4E-002
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	2.3E-003	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.2E-001
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	1.7E-003	mg/kg-day	8.0E-002	mg/kg-day	N/A	N/A	2.8E-002
	Dibenzofuran	368113	ug/kg	368113	ug/kg	M	1.9E-003	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	4.7E-001
	Fluorene	583363	ug/kg	583363	ug/kg	M	2.7E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	8.8E-002
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	8.8E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.1E-001
	Pyrene	1411478	ug/kg	1411478	ug/kg	M	8.8E-003	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	2.2E-001
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	1.4E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	2.7E-002
	Antimony	3.7	mg/kg	3.7	mg/kg	M	1.3E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	3.3E-003
	Arsenic	48	mg/kg	48	mg/kg	M	5.0E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.7E-001
	Copper	253	mg/kg	253	mg/kg	M	9.1E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.3E-003
	Manganese	239	mg/kg	239	mg/kg	M	8.8E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	3.8E-003
	Thallium	0.9	mg/kg	0.9	mg/kg	M	3.2E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	4.8E-003
	Zinc	981	mg/kg	981	mg/kg	M	3.5E-004	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	1.2E-003
	(Total)												1.3E+000
Total Hazard Index Across All Exposure Routes/Pathways													1.4E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400290

TABLE 7.8 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 4 - ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	1.5E-005	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	7.4E-001
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	8.3E-009	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Antimony	31700	mg/kg	31700	mg/kg	M	1.8E-002	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	3.9E+001
	Arsenic	254	mg/kg	254	mg/kg	M	1.2E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.1E-001
	(Total)												4.0E+001
Dermal	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	2.4E-004	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.2E+001
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	2.9E-008	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Antimony	31700	mg/kg	31700	mg/kg	M	1.8E-002	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	4.5E+001
	Arsenic	254	mg/kg	254	mg/kg	M	4.3E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.4E+000
	(Total)												5.6E+001
Total Hazard Index Across All Exposure Routes/Pathways													9.9E+001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic

— - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

400291

TABLE 7.9.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 4 - ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aroclor-1254	5500	ug/kg	5500	ug/kg	M	1.1E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	5.6E-002
	2,3,7,8-TCDD equiv.	3.2	ug/kg	3.2	ug/kg	M	6.4E-010	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Antimony	8017	mg/kg	8017	mg/kg	M	1.8E-003	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	4.5E+000
	Arsenic	156	mg/kg	156	mg/kg	M	3.1E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.0E-001
	(Total)												4.7E+000
Dermal	Aroclor-1254	5500	ug/kg	5500	ug/kg	M	2.8E-005	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.4E+000
	2,3,7,8-TCDD equiv.	3.2	ug/kg	3.2	ug/kg	M	3.5E-008	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Antimony	8017	mg/kg	8017	mg/kg	M	3.2E-003	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	8.1E+000
	Arsenic	156	mg/kg	156	mg/kg	M	1.7E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.6E-001
	(Total)												1.0E+001
Total Hazard Index Across All Exposure Routes/Pathways													1.5E+001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

— - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400292

TABLE 7.9 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	1.3E-003	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	1.7E-003	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	1.3E-003	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	3.8E-004	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Dibenzo(a,h)anthracene	90000	ug/kg	90000	ug/kg	M	1.1E-004	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Naphthalene	320000	ug/kg	320000	ug/kg	M	3.8E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	1.9E-002
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	1.3E-003	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	8.6E-002
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	9.8E-004	mg/kg-day	6.0E-002	mg/kg-day	N/A	N/A	1.6E-002
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	1.2E-003	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	3.0E-001
	Fluorene	1800000	ug/kg	1800000	ug/kg	M	1.9E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	4.9E-002
	Fluoranthene	3800000	ug/kg	3800000	ug/kg	M	4.7E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.2E-001
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	3.4E-003	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	1.1E-001
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	1.8E-004	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	3.8E-002
	Antimony	5.7	mg/kg	5.7	mg/kg	M	8.8E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.7E-002
	Arsenic	84	mg/kg	84	mg/kg	M	1.0E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.4E-001
	Copper	495	mg/kg	495	mg/kg	M	5.9E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.5E-002
	Manganese	495	mg/kg	495	mg/kg	M	5.9E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.5E-002
	Thallium	1.8	mg/kg	1.8	mg/kg	M	2.2E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	3.1E-002
	Zinc	3050	mg/kg	3050	mg/kg	M	3.7E-003	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	1.2E-002
	(Total)												1.1E+000
Dermal	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	1.7E-004	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	2.2E-004	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	1.7E-004	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	4.7E-005	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Dibenzo(a,h)anthracene	90000	ug/kg	90000	ug/kg	M	1.4E-005	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Naphthalene	320000	ug/kg	320000	ug/kg	M	5.0E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	2.5E-003
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	1.7E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	8.6E-003
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	1.2E-004	mg/kg-day	6.0E-002	mg/kg-day	N/A	N/A	2.1E-003
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	1.6E-004	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	3.9E-002
	Fluorene	1800000	ug/kg	1800000	ug/kg	M	2.5E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	8.2E-003
	Fluoranthene	3800000	ug/kg	3800000	ug/kg	M	6.1E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.5E-002
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	4.4E-004	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	1.5E-002
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	1.8E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	3.8E-003
	Antimony	5.7	mg/kg	5.7	mg/kg	M	8.8E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.7E-004
	Arsenic	84	mg/kg	84	mg/kg	M	3.0E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.0E-002
	Copper	495	mg/kg	495	mg/kg	M	5.9E-008	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.5E-004
	Manganese	495	mg/kg	495	mg/kg	M	5.9E-008	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.5E-004
	Thallium	1.8	mg/kg	1.8	mg/kg	M	2.2E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	3.1E-004
	Zinc	3050	mg/kg	3050	mg/kg	M	3.7E-005	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	1.2E-004
	(Total)												1.0E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.3E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

— Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable



TABLE 7.9.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzo(a)anthracene	468143	ug/kg	468143	ug/kg	M	5.8E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	6.5E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	426820	ug/kg	426820	ug/kg	M	5.1E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	1.8E-004	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	5.1E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Naphthalene	100988	ug/kg	100988	ug/kg	M	1.2E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	8.1E-003
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	8.0E-004	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	3.0E-002
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	4.3E-004	mg/kg-day	6.0E-002	mg/kg-day	N/A	N/A	7.1E-003
	Dibenzofuran	398113	ug/kg	398113	ug/kg	M	4.8E-004	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	1.2E-001
	Fluorene	583363	ug/kg	583363	ug/kg	M	7.0E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	1.8E-002
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	2.2E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	5.5E-002
	Pyrene	1411478	ug/kg	1411478	ug/kg	M	1.7E-003	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	5.6E-002
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	4.5E-005	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	9.1E-003
	Arsimony	3.7	mg/kg	3.7	mg/kg	M	4.4E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.1E-002
	Arsenic	46	mg/kg	46	mg/kg	M	5.5E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.6E-001
	Copper	253	mg/kg	253	mg/kg	M	3.0E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	7.6E-003
	Manganese	238	mg/kg	238	mg/kg	M	2.9E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.2E-002
	Thallium	0.9	mg/kg	0.9	mg/kg	M	1.1E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.5E-002
	Zinc	861	mg/kg	861	mg/kg	M	1.2E-003	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	3.9E-003
	(Total)												5.3E-001
Dermal	Benzo(a)anthracene	468143	ug/kg	468143	ug/kg	M	7.3E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	8.4E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	426820	ug/kg	426820	ug/kg	M	6.7E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	2.3E-005	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	6.6E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Naphthalene	100988	ug/kg	100988	ug/kg	M	1.6E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	7.9E-004
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	7.8E-005	mg/kg-day	2.0E-002	mg/kg-day	N/A	N/A	3.9E-003
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	5.6E-005	mg/kg-day	8.0E-002	mg/kg-day	N/A	N/A	9.3E-004
	Dibenzofuran	398113	ug/kg	398113	ug/kg	M	6.2E-005	mg/kg-day	4.0E-003	mg/kg-day	N/A	N/A	1.6E-002
	Fluorene	583363	ug/kg	583363	ug/kg	M	9.1E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.3E-003
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	2.9E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	7.2E-003
	Pyrene	1411478	ug/kg	1411478	ug/kg	M	2.2E-004	mg/kg-day	3.0E-002	mg/kg-day	N/A	N/A	7.3E-003
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	4.5E-008	mg/kg-day	5.0E-003	mg/kg-day	N/A	N/A	9.1E-004
	Arsimony	3.7	mg/kg	3.7	mg/kg	M	4.4E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.1E-004
	Arsenic	46	mg/kg	46	mg/kg	M	1.7E-008	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.5E-003
	Copper	253	mg/kg	253	mg/kg	M	3.0E-008	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	7.6E-003
	Manganese	238	mg/kg	238	mg/kg	M	2.9E-008	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	1.2E-004
	Thallium	0.9	mg/kg	0.9	mg/kg	M	1.1E-008	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	1.5E-004
	Zinc	861	mg/kg	861	mg/kg	M	1.2E-005	mg/kg-day	3.0E-001	mg/kg-day	N/A	N/A	3.9E-005
	(Total)												4.5E-002
Total Hazard Index Across All Exposure Routes/Pathways													5.6E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400294

TABLE 7.9 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 4 - ARC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	3.6E-005	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.8E+000
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	2.0E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	31700	mg/kg	31700	mg/kg	M	3.8E-002	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	9.5E+001
	Arsenic	254	mg/kg	254	mg/kg	M	3.0E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.0E+000
	(Total)												9.8E+001
Dermal	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	6.7E-005	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	3.4E+000
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	8.2E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Antimony	31700	mg/kg	31700	mg/kg	M	5.1E-003	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.3E+001
	Arsenic	254	mg/kg	254	mg/kg	M	1.2E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.1E-001
	(Total)												1.8E+001
Total Hazard Index Across All Exposure Routes/Pathways													1.1E+002

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

400295

TABLE 7.9.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 4 - ARC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aroclor-1254	5500	ug/kg	5500	ug/kg	M	6.7E-008	mg/kg-day	2.0E-006	mg/kg-day	N/A	N/A	3.4E-001
	2,3,7,8-TCDD equiv.	3.2	ug/kg	3.2	ug/kg	M	3.8E-008	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Antimony	9017	mg/kg	9017	mg/kg	M	1.1E-002	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	2.7E+001
	Arsenic	155	mg/kg	155	mg/kg	M	1.9E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	6.2E-001
	(Total)												2.8E+001
Dermal	Aroclor-1254	5500	ug/kg	5500	ug/kg	M	1.3E-005	mg/kg-day	2.0E-006	mg/kg-day	N/A	N/A	6.3E-001
	2,3,7,8-TCDD equiv.	3.2	ug/kg	3.2	ug/kg	M	1.5E-008	mg/kg-day	—	mg/kg-day	N/A	N/A	—
	Antimony	9017	mg/kg	9017	mg/kg	M	1.4E-003	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	3.6E+000
	Arsenic	155	mg/kg	155	mg/kg	M	7.4E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.5E-001
	(Total)												4.6E+000
Total Hazard Index Across All Exposure Routes/Pathways													3.2E+001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

— Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400296

TABLE 7.10 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 5 - DSM  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	0.589	mg/l	0.569	mg/l	M	8.8E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.3E-001
	Manganese	1.19	mg/l	1.19	mg/l	M	1.4E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	6.0E-003
	(Total)												2.3E-001
Dermal	Arsenic	0.589	mg/l	0.569	mg/l	M	3.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.1E-001
	Manganese	1.19	mg/l	1.19	mg/l	M	6.7E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.8E-003
	(Total)												1.1E-001
Total Hazard Index Across All Exposure Routes/Pathways													3.4E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

400297

TABLE 7.10 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 6 - RR  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aluminum	2.31	mg/l	2.31	mg/l	M	2.8E-004	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	2.8E-004
	Antimony	0.0057	mg/l	0.0057	mg/l	M	8.8E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.7E-003
	Arsenic	0.02	mg/l	0.02	mg/l	M	2.4E-006	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	8.0E-003
	Copper	0.249	mg/l	0.249	mg/l	M	3.0E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	7.5E-004
	Manganese	0.101	mg/l	0.101	mg/l	M	1.2E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	5.1E-004
	Thallium	0.005	mg/l	0.005	mg/l	M	8.0E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	8.8E-003
	Vanadium	0.0186	mg/l	0.0186	mg/l	M	2.2E-006	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	3.2E-004
	(Total)												2.0E-002
Dermal	Aluminum	2.31	mg/l	2.31	mg/l	M	1.3E-004	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.3E-004
	Antimony	0.0057	mg/l	0.0057	mg/l	M	3.2E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	8.0E-004
	Arsenic	0.02	mg/l	0.02	mg/l	M	1.1E-006	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.7E-003
	Copper	0.249	mg/l	0.249	mg/l	M	1.4E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	3.5E-004
	Manganese	0.101	mg/l	0.101	mg/l	M	5.7E-006	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.4E-004
	Thallium	0.005	mg/l	0.005	mg/l	M	2.8E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	4.0E-003
	Vanadium	0.0186	mg/l	0.0186	mg/l	M	1.0E-006	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	1.5E-004
	(Total)												9.4E-003
Total Hazard Index Across All Exposure Routes/Pathways													3.0E-002

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

TABLE 7.11 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 5 - DSM  
Receptor Population: Residents  
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	0.569	mg/l	0.569	mg/l	M	3.2E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.1E+000
	Manganese	1.19	mg/l	1.19	mg/l	M	6.8E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.8E-002
	(Total)												1.1E+000
Dermal	Arsenic	0.569	mg/l	0.569	mg/l	M	5.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.7E-001
	Manganese	1.19	mg/l	1.19	mg/l	M	1.1E-004	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	4.5E-003
	(Total)												1.8E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.3E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

(2) Chronic

-- Reference Dose not available, therefore Hazard Quotient not calculated

N/A - Not Applicable

400299

TABLE 7.11 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 6 - RR  
Receptor Population: Residents  
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Aluminum	2.31	mg/l	2.31	mg/l	M	1.3E-003	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	1.3E-003
	Antimony	0.0057	mg/l	0.0057	mg/l	M	3.2E-008	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	8.1E-003
	Arsenic	0.02	mg/l	0.02	mg/l	M	1.1E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.8E-002
	Copper	0.249	mg/l	0.249	mg/l	M	1.4E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	3.5E-003
	Manganese	0.101	mg/l	0.101	mg/l	M	5.8E-005	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	2.4E-003
	Thallium	0.005	mg/l	0.005	mg/l	M	2.9E-006	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	4.1E-002
	Vanadium	0.0186	mg/l	0.0186	mg/l	M	1.1E-005	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	1.5E-003
	(Total)												6.6E-002
Dermal	Aluminum	2.31	mg/l	2.31	mg/l	M	2.1E-004	mg/kg-day	1.0E+000	mg/kg-day	N/A	N/A	2.1E-004
	Antimony	0.0057	mg/l	0.0057	mg/l	M	5.2E-007	mg/kg-day	4.0E-004	mg/kg-day	N/A	N/A	1.3E-003
	Arsenic	0.02	mg/l	0.02	mg/l	M	1.8E-006	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	6.1E-003
	Copper	0.249	mg/l	0.249	mg/l	M	2.3E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	5.7E-004
	Manganese	0.101	mg/l	0.101	mg/l	M	9.2E-006	mg/kg-day	2.4E-002	mg/kg-day	N/A	N/A	3.8E-004
	Thallium	0.005	mg/l	0.005	mg/l	M	4.8E-007	mg/kg-day	7.0E-005	mg/kg-day	N/A	N/A	6.5E-003
	Vanadium	0.0186	mg/l	0.0186	mg/l	M	1.7E-006	mg/kg-day	7.0E-003	mg/kg-day	N/A	N/A	2.4E-004
	(Total)												1.5E-002
Total Hazard Index Across All Exposure Routes/Pathways													1.1E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

--- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400300

TABLE 7.12.RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 5 - DSM  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	2.8E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	6.9E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	2.8E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	2.1E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	470	ug/kg	470	ug/kg	M	4.4E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.2E-003
	Arsenic	4030	mg/kg	4030	mg/kg	M	3.8E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.3E+000
	(Total)												1.3E+000
Dermal	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	9.4E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	2.3E-007	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	9.4E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	9.9E-008	mg/kg-day	--	mg/kg-day	N/A	N/A	--
	Aroclor-1254	470	ug/kg	470	ug/kg	M	1.8E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	7.9E-003
	Arsenic	4030	mg/kg	4030	ug/kg	M	2.9E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	9.7E-001
	(Total)												9.8E-001
Total Hazard Index Across All Exposure Routes/Pathways													2.2E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.



TABLE 7.12.CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 5 - DSM  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	2.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	407	ug/kg	407	ug/kg	M	3.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	300	ug/kg	300	ug/kg	M	2.8E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	2.1E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	387	ug/kg	387	ug/kg	M	3.8E-008	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.8E-003
	Arsenic	1917	mg/kg	1917	mg/kg	M	1.8E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	8.0E-001
	(Total)												8.0E-001
Dermal	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	9.4E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	407	ug/kg	407	ug/kg	M	1.3E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	300	ug/kg	300	ug/kg	M	9.4E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	6.9E-008	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	387	ug/kg	387	ug/kg	M	1.3E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	6.5E-003
	Arsenic	1917	mg/kg	1917	ug/kg	M	1.4E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	4.8E-001
	(Total)												4.7E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.1E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400302

TABLE 7.12 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 8 - RR  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	2200	mg/kg	2200	mg/kg	M	2.1E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	6.9E-001
	Copper	3580	mg/kg	3580	mg/kg	M	3.3E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	8.4E-003
	(Total)												7.0E-001
Dermal	Arsenic	2200	mg/kg	2200	mg/kg	M	1.0E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.3E-001
	Copper	3580	mg/kg	3580	mg/kg	M	6.5E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.1E-003
	(Total)												5.3E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.2E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable

400303

TABLE 7.12 CT  
CENTRAL TENDENCY EXPOSURE  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 6 - RR  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	450	mg/kg	450	mg/kg	M	4.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.4E-001
	Copper	1573	mg/kg	1573	mg/kg	M	1.5E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	3.7E-003
	(Total)												1.4E-001
Dermal	Arsenic	450	mg/kg	450	mg/kg	M	3.2E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.1E-001
	Copper	1573	mg/kg	1573	mg/kg	M	3.8E-005	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	9.4E-004
	(Total)												1.1E-001
Total Hazard Index Across All Exposure Routes/Pathways													2.5E-001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard evaluation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400304

TABLE 7.13 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: ADC 5 - DSM  
Receptor Population: Residents  
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	2.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	6.4E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	300	ug/kg	300	ug/kg	M	2.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	1.9E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	470	ug/kg	470	ug/kg	M	4.1E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.1E-002
	Arsenic	4030	mg/kg	4030	mg/kg	M	3.5E-003	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.2E+001
	(Total)												1.2E+001
Dermal	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	2.7E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	6.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(e)pyrene	300	ug/kg	300	ug/kg	M	2.7E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	2.0E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	470	ug/kg	470	ug/kg	M	4.8E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	2.3E-002
	Arsenic	4030	mg/kg	4030	ug/kg	M	8.5E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	2.8E+000
	(Total)												2.8E+000
Total Hazard Index Across All Exposure Routes/Pathways													1.5E+001

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

- - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400305

TABLE 7.13.CT  
CENTRAL TENDENCY EXPOSURE  
REASONABLE MAXIMUM EXPOSURE  
HORBESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 5 - DSM  
Receptor Population: Residents  
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	2.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	407	ug/kg	407	ug/kg	M	3.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	2.8E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	1.9E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	387	ug/kg	387	ug/kg	M	3.4E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.7E-002
	Arsenic	1917	mg/kg	1917	mg/kg	M	1.7E-003	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	5.6E+000
	(Total)												5.6E+000
Dermal	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	2.7E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(b)fluoranthene	407	ug/kg	407	ug/kg	M	3.7E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	2.7E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	2.0E-007	mg/kg-day	-	mg/kg-day	N/A	N/A	-
	Aroclor-1254	387	ug/kg	387	ug/kg	M	3.8E-007	mg/kg-day	2.0E-005	mg/kg-day	N/A	N/A	1.9E-002
	Arsenic	1917	mg/kg	1917	ug/kg	M	4.0E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.3E+000
	(Total)												1.4E+000
Total Hazard Index Across All Exposure Routes/Pathways													7.0E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

- - Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400306

TABLE 7.13 RME  
CALCULATION OF NON-CANCER HAZARDS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 8 - RR  
Receptor Population: Residents  
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	2200	mg/kg	2200	mg/kg	M	1.9E-003	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	6.5E+000
	Copper	3680	mg/kg	3580	mg/kg	M	3.1E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	7.8E-002
	(Total)												8.5E+000
Dermal	Arsenic	2200	mg/kg	2200	mg/kg	M	4.8E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.5E+000
	Copper	3680	mg/kg	3580	mg/kg	M	2.5E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	6.2E-003
	(Total)												1.5E+000
Total Hazard Index Across All Exposure Routes/Pathways													8.1E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400307

TABLE 7.13 CT  
CALCULATION OF NON-CANCER HAZARDS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 6 - RR  
Receptor Population: Residents  
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	450	mg/kg	450	mg/kg	M	4.0E-004	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	1.3E+000
	Copper	1573	mg/kg	1573	mg/kg	M	1.4E-003	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	3.5E-002
	(Total)												1.4E+000
Dermal	Arsenic	450	mg/kg	450	mg/kg	M	9.5E-005	mg/kg-day	3.0E-004	mg/kg-day	N/A	N/A	3.2E-001
	Copper	1573	mg/kg	1573	mg/kg	M	1.1E-004	mg/kg-day	4.0E-002	mg/kg-day	N/A	N/A	2.8E-001
	(Total)												3.2E-001
Total Hazard Index Across All Exposure Routes/Pathways													1.7E+000

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

(2) Chronic.

-- Reference Dose not available, therefore Hazard Quotient not calculated.

N/A - Not Applicable.

400308

TABLE 8.1 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Dieldrin	120	ug/kg	120	ug/kg	M	8.1E-010	mg/kg-day	1.8E+001	mg/kg-day	9.6E-008
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	4.8E-008	mg/kg-day	2.0E+000	mg/kg-day	9.7E-008
	Aroclor-1254	850	ug/kg	850	ug/kg	M	4.3E-009	mg/kg-day	2.0E+000	mg/kg-day	8.7E-009
	Aroclor-1260	720	ug/kg	720	ug/kg	M	3.7E-009	mg/kg-day	2.0E+000	mg/kg-day	7.3E-009
	Aluminum	14250	mg/kg	14250	mg/kg	M	7.3E-005	mg/kg-day	-	mg/kg-day	-
	Antimony	3.4	mg/kg	3.4	mg/kg	M	1.7E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	53	mg/kg	53	mg/kg	M	2.7E-007	mg/kg-day	1.5E+000	mg/kg-day	4.1E-007
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	2.3E-008	mg/kg-day	-	mg/kg-day	-
	Copper	433	mg/kg	433	mg/kg	M	2.2E-008	mg/kg-day	-	mg/kg-day	-
	Manganese	420	mg/kg	420	mg/kg	M	2.1E-008	mg/kg-day	-	mg/kg-day	-
	Nickel	108	mg/kg	108	mg/kg	M	5.5E-007	mg/kg-day	-	mg/kg-day	-
	Silver	30	mg/kg	30	mg/kg	M	1.5E-007	mg/kg-day	-	mg/kg-day	-
	Thallium	1	mg/kg	1	mg/kg	M	5.1E-009	mg/kg-day	-	mg/kg-day	-
	Vanadium	84	mg/kg	84	mg/kg	M	3.3E-007	mg/kg-day	-	mg/kg-day	-
	(Total)										5.3E-007
Dermal	Dieldrin	120	ug/kg	120	ug/kg	M	1.8E-009	mg/kg-day	1.8E+001	mg/kg-day	2.5E-008
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	1.7E-007	mg/kg-day	2.0E+000	mg/kg-day	3.5E-007
	Aroclor-1254	850	ug/kg	850	ug/kg	M	1.5E-008	mg/kg-day	2.0E+000	mg/kg-day	3.1E-008
	Aroclor-1260	720	ug/kg	720	ug/kg	M	1.3E-008	mg/kg-day	2.0E+000	mg/kg-day	2.6E-008
	Aluminum	14250	mg/kg	14250	mg/kg	M	1.9E-005	mg/kg-day	-	mg/kg-day	-
	Antimony	3.4	mg/kg	3.4	mg/kg	M	4.4E-009	mg/kg-day	-	mg/kg-day	-
	Arsenic	53	mg/kg	53	mg/kg	M	2.1E-007	mg/kg-day	1.5E+000	mg/kg-day	3.1E-007
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	5.9E-010	mg/kg-day	-	mg/kg-day	-
	Copper	433	mg/kg	433	mg/kg	M	5.6E-007	mg/kg-day	-	mg/kg-day	-
	Manganese	420	mg/kg	420	mg/kg	M	5.5E-007	mg/kg-day	-	mg/kg-day	-
	Nickel	108	mg/kg	108	mg/kg	M	1.4E-007	mg/kg-day	-	mg/kg-day	-
	Silver	30	mg/kg	30	mg/kg	M	3.9E-008	mg/kg-day	-	mg/kg-day	-
	Thallium	1	mg/kg	1	mg/kg	M	1.3E-009	mg/kg-day	-	mg/kg-day	-
	Vanadium	84	mg/kg	84	mg/kg	M	8.3E-008	mg/kg-day	-	mg/kg-day	-
	(Total)										7.4E-007
Total Risk Across All Exposure Pathways											1.3E-008

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated  
N/A - Not Applicable



TABLE 8.1.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	21000	ug/kg	21000	ug/kg	M	1.1E-007	mg/kg-day	7.3E-001	mg/kg-day	7.8E-008
	Benzo(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	1.5E-007	mg/kg-day	7.3E-001	mg/kg-day	1.1E-007
	Benzo(a)pyrene	20000	ug/kg	20000	ug/kg	M	1.0E-007	mg/kg-day	7.3E+000	mg/kg-day	7.4E-007
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	8.1E-008	mg/kg-day	7.3E-001	mg/kg-day	4.5E-008
	Dibenzo(a,h)anthracene	2300	ug/kg	2300	ug/kg	M	1.2E-008	mg/kg-day	7.3E+000	mg/kg-day	8.6E-008
	Aldrin	400	ug/kg	400	ug/kg	M	2.0E-009	mg/kg-day	1.7E+001	mg/kg-day	3.5E-008
	Dieldrin	740	ug/kg	740	ug/kg	M	3.8E-009	mg/kg-day	1.8E+001	mg/kg-day	6.0E-008
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	5.0E-008	mg/kg-day	-	mg/kg-day	-
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	1.7E-007	mg/kg-day	2.0E+000	mg/kg-day	3.5E-007
	Aroclor-1280	2500	ug/kg	2500	ug/kg	M	1.3E-008	mg/kg-day	2.0E+000	mg/kg-day	2.6E-008
	2,3,7,8-TCDD equiv.	0.308	ug/kg	0.308	ug/kg	M	1.6E-012	mg/kg-day	1.5E+005	mg/kg-day	2.4E-007
	Antimony	32	mg/kg	32	mg/kg	M	1.6E-007	mg/kg-day	-	mg/kg-day	-
	Arsenic	3840	mg/kg	3840	mg/kg	M	1.9E-005	mg/kg-day	1.5E+000	mg/kg-day	1.2E-005
	(Total)										1.4E-005
Dermal	Benzo(a)anthracene	21000	ug/kg	21000	ug/kg	M	3.5E-007	mg/kg-day	7.3E-001	mg/kg-day	2.6E-007
	Benzo(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	5.1E-007	mg/kg-day	7.3E-001	mg/kg-day	3.7E-007
	Benzo(a)pyrene	20000	ug/kg	20000	ug/kg	M	3.4E-007	mg/kg-day	7.3E+000	mg/kg-day	2.5E-008
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	2.0E-007	mg/kg-day	7.3E-001	mg/kg-day	1.5E-007
	Dibenzo(a,h)anthracene	2300	ug/kg	2300	ug/kg	M	3.9E-008	mg/kg-day	7.3E+000	mg/kg-day	2.6E-007
	Aldrin	400	ug/kg	400	ug/kg	M	5.2E-009	mg/kg-day	1.7E+001	mg/kg-day	8.6E-008
	Dieldrin	740	ug/kg	740	ug/kg	M	9.6E-009	mg/kg-day	1.6E+001	mg/kg-day	1.5E-007
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	1.3E-005	mg/kg-day	-	mg/kg-day	-
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	8.2E-007	mg/kg-day	2.0E+000	mg/kg-day	1.2E-008
	Aroclor-1280	2500	ug/kg	2500	ug/kg	M	4.6E-008	mg/kg-day	2.0E+000	mg/kg-day	9.1E-008
	2,3,7,8-TCDD equiv.	0.308	ug/kg	0.308	ug/kg	M	1.2E-012	mg/kg-day	1.5E+005	mg/kg-day	1.8E-007
	Antimony	32	mg/kg	32	mg/kg	M	4.2E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	3840	mg/kg	3840	mg/kg	M	1.4E-005	mg/kg-day	1.5E+000	mg/kg-day	9.5E-008
	(Total)										1.5E-005
Total Risk Across All Exposure Pathways											2.0E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

- - Cancer Slope Factor not available, therefore Cancer Risk not calculated.  
N/A - Not Applicable.

TABLE 8.1 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	8.7E-008	mg/kg-day	7.3E-001	mg/kg-day	8.3E-008
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	1.5E-008	mg/kg-day	7.3E-001	mg/kg-day	1.1E-008
	Benzo(a)pyrene	1468	ug/kg	1468	ug/kg	M	7.5E-008	mg/kg-day	7.3E+000	mg/kg-day	5.5E-008
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	6.6E-009	mg/kg-day	7.3E-001	mg/kg-day	4.8E-009
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	3.3E-008	mg/kg-day	--	mg/kg-day	--
	Aluminum	8432	mg/kg	8432	mg/kg	M	4.3E-005	mg/kg-day	--	mg/kg-day	--
	Arsimony	17	mg/kg	17	mg/kg	M	8.7E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	24	mg/kg	24	mg/kg	M	1.2E-007	mg/kg-day	1.5E+000	mg/kg-day	1.8E-007
	Copper	1519	mg/kg	1519	mg/kg	M	7.7E-008	mg/kg-day	--	mg/kg-day	--
	Manganese	215	mg/kg	215	mg/kg	M	1.1E-008	mg/kg-day	--	mg/kg-day	--
	Thallium	0.92	mg/kg	0.92	mg/kg	M	4.7E-009	mg/kg-day	--	mg/kg-day	--
	Vanadium	37	mg/kg	37	mg/kg	M	1.9E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										2.8E-007
Dermal	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	2.9E-008	mg/kg-day	7.3E-001	mg/kg-day	2.1E-008
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	4.9E-008	mg/kg-day	7.3E-001	mg/kg-day	3.6E-008
	Benzo(a)pyrene	1468	ug/kg	1468	ug/kg	M	2.5E-008	mg/kg-day	7.3E+000	mg/kg-day	1.8E-007
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	2.2E-008	mg/kg-day	7.3E-001	mg/kg-day	1.6E-008
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	6.5E-008	mg/kg-day	--	mg/kg-day	--
	Aluminum	8432	mg/kg	8432	mg/kg	M	1.1E-005	mg/kg-day	--	mg/kg-day	--
	Arsimony	17	mg/kg	17	mg/kg	M	2.2E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	24	mg/kg	24	mg/kg	M	9.4E-008	mg/kg-day	1.5E+000	mg/kg-day	1.4E-007
	Copper	1519	mg/kg	1519	mg/kg	M	2.0E-008	mg/kg-day	--	mg/kg-day	--
	Manganese	215	mg/kg	215	mg/kg	M	2.8E-007	mg/kg-day	--	mg/kg-day	--
	Thallium	0.92	mg/kg	0.92	mg/kg	M	1.2E-008	mg/kg-day	--	mg/kg-day	--
	Vanadium	37	mg/kg	37	mg/kg	M	4.8E-008	mg/kg-day	--	mg/kg-day	--
	(Total)										3.9E-007
Total Risk Across All Exposure Pathways:											6.5E-007

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated  
N/A - Not Applicable

TABLE 8.1 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(b)fluoranthene	2800	ug/kg	2800	ug/kg	M	1.3E-008	mg/kg-day	7.3E-001	mg/kg-day	9.7E-008
	Benzo(a)pyrene	1800	ug/kg	1800	ug/kg	M	9.2E-009	mg/kg-day	7.3E+000	mg/kg-day	6.7E-008
	Hexachlorobutadiene	6800	ug/kg	6800	ug/kg	M	3.5E-008	mg/kg-day	7.8E-002	mg/kg-day	2.7E-008
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	2.9E-007	mg/kg-day	--	mg/kg-day	--
	Aldrin	22	ug/kg	22	ug/kg	M	1.1E-010	mg/kg-day	1.7E+001	mg/kg-day	1.9E-009
	Aroclor-1248	891	ug/kg	891	ug/kg	M	4.5E-008	mg/kg-day	2.0E+000	mg/kg-day	9.1E-008
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	9.9E-009	mg/kg-day	2.0E+000	mg/kg-day	2.0E-008
	Aroclor-1260	485	ug/kg	485	ug/kg	M	2.4E-009	mg/kg-day	2.0E+000	mg/kg-day	4.7E-009
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	1.0E-012	mg/kg-day	1.5E+005	mg/kg-day	1.5E-007
	Aluminum	15500	mg/kg	15500	mg/kg	M	7.9E-005	mg/kg-day	--	mg/kg-day	--
	Antimony	18	mg/kg	18	mg/kg	M	9.2E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	27	mg/kg	27	mg/kg	M	1.4E-007	mg/kg-day	1.5E+000	mg/kg-day	2.1E-007
	Cadmium	37	mg/kg	37	mg/kg	M	1.9E-007	mg/kg-day	--	mg/kg-day	--
	Copper	591	mg/kg	591	mg/kg	M	3.0E-008	mg/kg-day	--	mg/kg-day	--
	Manganese	461	mg/kg	461	mg/kg	M	2.4E-008	mg/kg-day	--	mg/kg-day	--
	Nickel	298	mg/kg	298	mg/kg	M	1.5E-008	mg/kg-day	--	mg/kg-day	--
	Silver	287	mg/kg	287	mg/kg	M	1.5E-008	mg/kg-day	--	mg/kg-day	--
	Thallium	0.72	mg/kg	0.72	mg/kg	M	3.7E-009	mg/kg-day	--	mg/kg-day	--
	Zinc	9172	mg/kg	9172	mg/kg	M	4.7E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										4.7E-007
Dermal	Benzo(b)fluoranthene	2800	ug/kg	2800	ug/kg	M	4.4E-008	mg/kg-day	7.3E-001	mg/kg-day	3.2E-008
	Benzo(a)pyrene	1800	ug/kg	1800	ug/kg	M	3.0E-008	mg/kg-day	7.3E+000	mg/kg-day	2.2E-007
	Hexachlorobutadiene	6800	ug/kg	6800	ug/kg	M	8.8E-008	mg/kg-day	7.8E-002	mg/kg-day	6.9E-008
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	7.5E-007	mg/kg-day	--	mg/kg-day	--
	Aldrin	22	ug/kg	22	ug/kg	M	2.9E-010	mg/kg-day	1.7E+001	mg/kg-day	4.9E-009
	Aroclor-1248	891	ug/kg	891	ug/kg	M	1.8E-008	mg/kg-day	2.0E+000	mg/kg-day	3.2E-008
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	3.5E-008	mg/kg-day	2.0E+000	mg/kg-day	7.1E-008
	Aroclor-1260	485	ug/kg	485	ug/kg	M	8.5E-009	mg/kg-day	2.0E+000	mg/kg-day	1.7E-008
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	7.8E-013	mg/kg-day	1.5E+005	mg/kg-day	1.2E-007
	Aluminum	15500	mg/kg	15500	mg/kg	M	2.0E-005	mg/kg-day	--	mg/kg-day	--
	Antimony	18	mg/kg	18	mg/kg	M	2.3E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	27	mg/kg	27	mg/kg	M	1.1E-007	mg/kg-day	1.5E+000	mg/kg-day	1.6E-007
	Cadmium	37	mg/kg	37	mg/kg	M	4.8E-009	mg/kg-day	--	mg/kg-day	--
	Copper	591	mg/kg	591	mg/kg	M	7.7E-007	mg/kg-day	--	mg/kg-day	--
	Manganese	461	mg/kg	461	mg/kg	M	6.0E-007	mg/kg-day	--	mg/kg-day	--
	Nickel	298	mg/kg	298	mg/kg	M	3.8E-007	mg/kg-day	--	mg/kg-day	--
	Silver	287	mg/kg	287	mg/kg	M	3.7E-007	mg/kg-day	--	mg/kg-day	--
	Thallium	0.72	mg/kg	0.72	mg/kg	M	9.4E-010	mg/kg-day	--	mg/kg-day	--
	Zinc	9172	mg/kg	9172	mg/kg	M	1.2E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										8.8E-007
Total Risk Across All Exposure Pathways											1.1E-006

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.  
N/A - Not Applicable

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TABLE B 2 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	5.6E-006	mg/kg-day	7.3E-001	mg/kg-day	4.1E-006
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	7.1E-006	mg/kg-day	7.3E-001	mg/kg-day	5.2E-006
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	5.6E-006	mg/kg-day	7.3E+000	mg/kg-day	4.1E-005
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	1.5E-006	mg/kg-day	7.3E-001	mg/kg-day	1.1E-006
	Dibenzo(a,h)anthracene	90000	ug/kg	90000	ug/kg	M	4.6E-007	mg/kg-day	7.3E+000	mg/kg-day	3.4E-006
	Naphthalene	320000	ug/kg	320000	ug/kg	M	1.6E-006	mg/kg-day	--	mg/kg-day	--
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	5.6E-006	mg/kg-day	--	mg/kg-day	--
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	4.1E-006	mg/kg-day	--	mg/kg-day	--
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	5.1E-006	mg/kg-day	--	mg/kg-day	--
	Fluorene	1600000	ug/kg	1600000	ug/kg	M	8.2E-006	mg/kg-day	--	mg/kg-day	--
	Fluoranthene	3900000	ug/kg	3900000	ug/kg	M	2.0E-005	mg/kg-day	--	mg/kg-day	--
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	1.4E-005	mg/kg-day	--	mg/kg-day	--
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	7.7E-007	mg/kg-day	--	mg/kg-day	--
	Antimony	5.7	mg/kg	5.7	mg/kg	M	2.9E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	84	mg/kg	84	mg/kg	M	4.3E-007	mg/kg-day	1.5E+000	mg/kg-day	6.4E-007
	Copper	495	mg/kg	495	mg/kg	M	2.3E-006	mg/kg-day	--	mg/kg-day	--
	Manganese	495	mg/kg	495	mg/kg	M	2.5E-006	mg/kg-day	--	mg/kg-day	--
	Thallium	1.8	mg/kg	1.8	mg/kg	M	9.2E-009	mg/kg-day	--	mg/kg-day	--
	Zinc	3050	mg/kg	3050	mg/kg	M	1.6E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										5.5E-005
Dermal	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	1.9E-005	mg/kg-day	7.3E-001	mg/kg-day	1.4E-005
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	2.4E-005	mg/kg-day	7.3E-001	mg/kg-day	1.7E-005
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	1.9E-005	mg/kg-day	7.3E+000	mg/kg-day	1.4E-004
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	5.1E-006	mg/kg-day	7.3E-001	mg/kg-day	3.7E-006
	Dibenzo(a,h)anthracene	90000	ug/kg	90000	ug/kg	M	1.5E-006	mg/kg-day	7.3E+000	mg/kg-day	1.1E-005
	Naphthalene	320000	ug/kg	320000	ug/kg	M	5.4E-006	mg/kg-day	--	mg/kg-day	--
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	1.9E-005	mg/kg-day	--	mg/kg-day	--
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	1.4E-005	mg/kg-day	--	mg/kg-day	--
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	1.7E-005	mg/kg-day	--	mg/kg-day	--
	Fluorene	1600000	ug/kg	1600000	ug/kg	M	2.7E-005	mg/kg-day	--	mg/kg-day	--
	Fluoranthene	3900000	ug/kg	3900000	ug/kg	M	6.8E-005	mg/kg-day	--	mg/kg-day	--
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	4.7E-005	mg/kg-day	--	mg/kg-day	--
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	2.0E-006	mg/kg-day	--	mg/kg-day	--
	Antimony	5.7	mg/kg	5.7	mg/kg	M	7.4E-009	mg/kg-day	--	mg/kg-day	--
	Arsenic	84	mg/kg	84	mg/kg	M	3.3E-007	mg/kg-day	1.5E+000	mg/kg-day	4.9E-007
	Copper	495	mg/kg	495	mg/kg	M	6.4E-007	mg/kg-day	--	mg/kg-day	--
	Manganese	495	mg/kg	495	mg/kg	M	6.4E-007	mg/kg-day	--	mg/kg-day	--
	Thallium	1.8	mg/kg	1.8	mg/kg	M	2.3E-009	mg/kg-day	--	mg/kg-day	--
	Zinc	3050	mg/kg	3050	mg/kg	M	4.0E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										1.8E-004
											2.4E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated

TABLE 8.2.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	488143	ug/kg	488143	ug/kg	M	1.2E-008	mg/kg-day	7.3E-001	mg/kg-day	8.9E-007
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	1.4E-008	mg/kg-day	7.3E-001	mg/kg-day	1.0E-006
	Benzo(a)pyrene	426620	ug/kg	426620	ug/kg	M	1.1E-008	mg/kg-day	7.3E+000	mg/kg-day	8.1E-006
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	3.8E-007	mg/kg-day	7.3E-001	mg/kg-day	2.8E-007
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	1.1E-007	mg/kg-day	7.3E+000	mg/kg-day	8.1E-007
	Naphthalene	100988	ug/kg	100988	ug/kg	M	2.6E-007	mg/kg-day	-	mg/kg-day	-
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	1.3E-008	mg/kg-day	-	mg/kg-day	-
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	9.3E-007	mg/kg-day	-	mg/kg-day	-
	Dibenzofuran	398113	ug/kg	398113	ug/kg	M	1.0E-008	mg/kg-day	-	mg/kg-day	-
	Fluorene	583363	ug/kg	583363	ug/kg	M	1.5E-008	mg/kg-day	-	mg/kg-day	-
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	4.8E-008	mg/kg-day	-	mg/kg-day	-
	Pyrene	14111478	ug/kg	14111478	ug/kg	M	3.7E-005	mg/kg-day	-	mg/kg-day	-
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	9.8E-008	mg/kg-day	-	mg/kg-day	-
	Antimony	3.7	mg/kg	3.7	mg/kg	M	9.6E-012	mg/kg-day	-	mg/kg-day	-
	Arsenic	46	mg/kg	46	mg/kg	M	1.2E-010	mg/kg-day	1.5E+000	mg/kg-day	1.8E-010
	Copper	253	mg/kg	253	mg/kg	M	6.8E-010	mg/kg-day	-	mg/kg-day	-
	Manganese	239	mg/kg	239	mg/kg	M	6.2E-010	mg/kg-day	-	mg/kg-day	-
	Thallium	0.9	mg/kg	0.9	mg/kg	M	2.3E-012	mg/kg-day	-	mg/kg-day	-
	Zinc	981	mg/kg	981	mg/kg	M	2.6E-009	mg/kg-day	-	mg/kg-day	-
	(Total)										1.1E-006
Dermal	Benzo(a)anthracene	488143	ug/kg	488143	ug/kg	M	7.9E-008	mg/kg-day	7.3E-001	mg/kg-day	5.8E-006
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	9.1E-008	mg/kg-day	7.3E-001	mg/kg-day	6.7E-006
	Benzo(a)pyrene	426620	ug/kg	426620	ug/kg	M	7.2E-008	mg/kg-day	7.3E+000	mg/kg-day	5.3E-005
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	2.5E-008	mg/kg-day	7.3E-001	mg/kg-day	1.8E-006
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	7.2E-007	mg/kg-day	7.3E+000	mg/kg-day	5.2E-008
	Naphthalene	100988	ug/kg	100988	ug/kg	M	1.7E-008	mg/kg-day	-	mg/kg-day	-
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	8.4E-008	mg/kg-day	-	mg/kg-day	-
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	6.0E-008	mg/kg-day	-	mg/kg-day	-
	Dibenzofuran	398113	ug/kg	398113	ug/kg	M	6.7E-008	mg/kg-day	-	mg/kg-day	-
	Fluorene	583363	ug/kg	583363	ug/kg	M	9.9E-008	mg/kg-day	-	mg/kg-day	-
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	3.1E-005	mg/kg-day	-	mg/kg-day	-
	Pyrene	14111478	ug/kg	14111478	ug/kg	M	2.4E-004	mg/kg-day	-	mg/kg-day	-
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	4.9E-007	mg/kg-day	-	mg/kg-day	-
	Antimony	3.7	mg/kg	3.7	mg/kg	M	4.8E-009	mg/kg-day	-	mg/kg-day	-
	Arsenic	46	mg/kg	46	mg/kg	M	1.8E-007	mg/kg-day	1.5E+000	mg/kg-day	2.7E-007
	Copper	253	mg/kg	253	mg/kg	M	3.3E-007	mg/kg-day	-	mg/kg-day	-
	Manganese	239	mg/kg	239	mg/kg	M	3.1E-007	mg/kg-day	-	mg/kg-day	-
	Thallium	0.9	mg/kg	0.9	mg/kg	M	1.2E-009	mg/kg-day	-	mg/kg-day	-
	Zinc	981	mg/kg	981	mg/kg	M	1.3E-006	mg/kg-day	-	mg/kg-day	-
	(Total)										7.2E-005
											8.4E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable

TABLE B.2.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 4 - ARC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	1.5E-007	mg/kg-day	2.0E+000	mg/kg-day	3.1E-007
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	8.7E-011	mg/kg-day	1.5E+005	mg/kg-day	1.3E-005
	Antimony	31700	mg/kg	31700	mg/kg	M	1.0E-004	mg/kg-day	-	mg/kg-day	-
	Arsenic	254	mg/kg	254	mg/kg	M	1.3E-006	mg/kg-day	1.5E+000	mg/kg-day	1.9E-006
	(Total)										1.5E-005
Dermal	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	5.5E-007	mg/kg-day	2.0E+000	mg/kg-day	1.1E-006
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	8.6E-011	mg/kg-day	1.5E+005	mg/kg-day	9.9E-006
	Antimony	31700	mg/kg	31700	mg/kg	M	4.1E-005	mg/kg-day	-	mg/kg-day	-
	Arsenic	254	mg/kg	254	mg/kg	M	9.9E-007	mg/kg-day	1.5E+000	mg/kg-day	1.5E-006
	(Total)										1.3E-005
											2.8E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

- - Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.3 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: ADC 1 - HRDD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Vinyl Chloride	0.004	mg/l	0.004	mg/l	M	1.0E-008	mg/kg-day	1.9E+000	mg/kg-day	2.0E-008
	Antimony	0.01	mg/l	0.01	mg/l	M	2.6E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.0898	mg/l	0.898	mg/l	M	2.3E-007	mg/kg-day	1.5E+000	mg/kg-day	3.5E-007
	Cadmium	0.0085	mg/l	0.0085	mg/l	M	2.2E-008	mg/kg-day	--	mg/kg-day	--
	Copper	1.23	mg/l	1.23	mg/l	M	3.2E-008	mg/kg-day	--	mg/kg-day	--
	Manganese	1.03	mg/l	1.03	mg/l	M	2.7E-008	mg/kg-day	--	mg/kg-day	--
	Nickel	0.144	mg/l	0.144	mg/l	M	3.7E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										3.7E-007
Dermal	Vinyl Chloride	0.004	mg/l	0.004	mg/l	M	1.4E-009	mg/kg-day	1.9E+000	mg/kg-day	2.8E-009
	Antimony	0.01	mg/l	0.01	mg/l	M	4.7E-010	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.0898	mg/l	0.898	mg/l	M	4.2E-009	mg/kg-day	1.5E+000	mg/kg-day	6.3E-009
	Cadmium	0.0085	mg/l	0.0085	mg/l	M	4.0E-010	mg/kg-day	--	mg/kg-day	--
	Copper	1.23	mg/l	1.23	mg/l	M	5.8E-008	mg/kg-day	--	mg/kg-day	--
	Manganese	1.03	mg/l	1.03	mg/l	M	4.8E-008	mg/kg-day	--	mg/kg-day	--
	Nickel	0.144	mg/l	0.144	mg/l	M	6.8E-008	mg/kg-day	--	mg/kg-day	--
	(Total)										8.6E-009
TOTAL RISK ACROSS ALL PATHWAYS											3.8E-007

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated

N/A - Not Applicable

TABLE 8.3 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 2 - ADC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Vinyl Chloride	0.0086	mg/l	0.0086	mg/l	M	2.5E-008	mg/kg-day	1.9E+000	mg/kg-day	4.8E-008
	Antimony	0.0086	mg/l	0.0086	mg/l	M	2.5E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.467	mg/l	0.467	mg/l	M	1.2E-008	mg/kg-day	1.5E+000	mg/kg-day	1.8E-008
	Manganese	0.673	mg/l	0.673	mg/l	M	1.7E-008	mg/kg-day	--	mg/kg-day	--
	Thallium	0.0023	mg/l	0.0023	mg/l	M	6.0E-009	mg/kg-day	--	mg/kg-day	--
	(Total)										1.9E-008
Dermal	Vinyl Chloride	0.0086	mg/l	0.0086	mg/l	M	3.4E-009	mg/kg-day	1.9E+000	mg/kg-day	6.4E-009
	Antimony	0.0086	mg/l	0.0086	mg/l	M	4.5E-010	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.467	mg/l	0.467	mg/l	M	2.2E-008	mg/kg-day	1.5E+000	mg/kg-day	3.3E-008
	Manganese	0.673	mg/l	0.673	mg/l	M	3.2E-008	mg/kg-day	--	mg/kg-day	--
	Thallium	0.0023	mg/l	0.0023	mg/l	M	1.1E-010	mg/kg-day	--	mg/kg-day	--
	(Total)										3.9E-008
TOTAL RISK ACROSS ALL PATHWAYS											1.9E-008

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- - Cancer Slope Factor not available, therefore Cancer Risk not calculated

N/A - Not Applicable



TABLE B.3 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: ADC 3 - SPD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Methoxychlor	0.00091	mg/l	0.00091	mg/l	M	2.4E-009	mg/kg-day	--	mg/kg-day	--
	Aluminum	2.81	mg/l	2.81	mg/l	M	8.8E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.0089	mg/l	0.0089	mg/l	M	2.6E-008	mg/kg-day	1.5E+000	mg/kg-day	3.9E-008
	Copper	0.247	mg/l	0.247	mg/l	M	8.4E-007	mg/kg-day	--	mg/kg-day	--
	Manganese	0.919	mg/l	0.919	mg/l	M	2.4E-008	mg/kg-day	--	mg/kg-day	--
	Vanadium	0.0074	mg/l	0.0074	mg/l	M	1.9E-008	mg/kg-day	--	mg/kg-day	--
	(Total)										3.9E-008
Dermal	Methoxychlor	0.00091	mg/l	0.00091	mg/l	M	7.3E-010	mg/kg-day	--	mg/kg-day	--
	Aluminum	2.81	mg/l	2.81	mg/l	M	1.2E-007	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.0089	mg/l	0.0089	mg/l	M	4.7E-010	mg/kg-day	1.5E+000	mg/kg-day	7.0E-010
	Copper	0.247	mg/l	0.247	mg/l	M	1.2E-008	mg/kg-day	--	mg/kg-day	--
	Manganese	0.919	mg/l	0.919	mg/l	M	4.3E-008	mg/kg-day	--	mg/kg-day	--
	Vanadium	0.0074	mg/l	0.0074	mg/l	M	3.5E-010	mg/kg-day	--	mg/kg-day	--
	(Total)										7.0E-010
TOTAL RISK ACROSS ALL PATHWAYS											3.9E-008

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated

N/A - Not Applicable

TABLE B.3 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 4 - ARC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk																																																																																																																
Ingestion	Antimony	0.082	mg/l	0.082	mg/l	M	2.4E-007	mg/kg-day	--	mg/kg-day	--																																																																																																																
	Arsenic	0.013	mg/l	0.013	mg/l	M	3.4E-008	mg/kg-day	1.5E+000	mg/kg-day	5.1E-008																																																																																																																
	Cadmium	0.0085	mg/l	0.0085	mg/l	M	2.2E-008	mg/kg-day	--	mg/kg-day	--																																																																																																																
	Copper	1.23	mg/l	1.23	mg/l	M	3.2E-008	mg/kg-day	--	mg/kg-day	--																																																																																																																
	Manganese	0.73	mg/l	0.73	mg/l	M	1.8E-008	mg/kg-day	--	mg/kg-day	--																																																																																																																
	Nickel	0.128	mg/l	0.128	mg/l	M	3.3E-007	mg/kg-day	--	mg/kg-day	--																																																																																																																
	Silver	0.038	mg/l	0.038	mg/l	M	9.9E-008	mg/kg-day	--	mg/kg-day	--	(Total)										5.1E-008	Dermal	Antimony	0.082	mg/l	0.082	mg/l	M	4.3E-009	mg/kg-day	--	mg/kg-day	--	Arsenic	0.013	mg/l	0.013	mg/l	M	8.1E-010	mg/kg-day	1.5E+000	mg/kg-day	9.2E-010	Cadmium	0.0085	mg/l	0.0085	mg/l	M	4.0E-010	mg/kg-day	--	mg/kg-day	--	Copper	1.23	mg/l	1.23	mg/l	M	5.8E-008	mg/kg-day	--	mg/kg-day	--	Manganese	0.73	mg/l	0.73	mg/l	M	3.4E-008	mg/kg-day	--	mg/kg-day	--	Nickel	0.128	mg/l	0.128	mg/l	M	8.0E-009	mg/kg-day	--	mg/kg-day	--	Silver	0.038	mg/l	0.038	mg/l	M	1.1E-009	mg/kg-day	--	mg/kg-day	--	(Total)										9.2E-010	TOTAL RISK ACROSS ALL PATHWAYS											5.2E-008
	(Total)										5.1E-008																																																																																																																
Dermal	Antimony	0.082	mg/l	0.082	mg/l	M	4.3E-009	mg/kg-day	--	mg/kg-day	--																																																																																																																
	Arsenic	0.013	mg/l	0.013	mg/l	M	8.1E-010	mg/kg-day	1.5E+000	mg/kg-day	9.2E-010																																																																																																																
	Cadmium	0.0085	mg/l	0.0085	mg/l	M	4.0E-010	mg/kg-day	--	mg/kg-day	--																																																																																																																
	Copper	1.23	mg/l	1.23	mg/l	M	5.8E-008	mg/kg-day	--	mg/kg-day	--																																																																																																																
	Manganese	0.73	mg/l	0.73	mg/l	M	3.4E-008	mg/kg-day	--	mg/kg-day	--																																																																																																																
	Nickel	0.128	mg/l	0.128	mg/l	M	8.0E-009	mg/kg-day	--	mg/kg-day	--																																																																																																																
	Silver	0.038	mg/l	0.038	mg/l	M	1.1E-009	mg/kg-day	--	mg/kg-day	--	(Total)										9.2E-010	TOTAL RISK ACROSS ALL PATHWAYS											5.2E-008																																																																																									
	(Total)										9.2E-010																																																																																																																
TOTAL RISK ACROSS ALL PATHWAYS											5.2E-008																																																																																																																

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- - Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable

400319

TABLE 8.3 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 5 - DSM  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Unit	Cancer Risk
Ingestion	Arsenic	0.569	mg/l	0.569	mg/l	M	1.5E-006	mg/kg-day	1.5E+000	mg/kg-day	2.2E-006
	Manganese	1.19	mg/l	1.19	mg/l	M	3.1E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										2.2E-006
Dermal	Arsenic	0.569	mg/l	0.569	mg/l	M	2.7E-008	mg/kg-day	1.5E+000	mg/kg-day	4.0E-008
	Manganese	1.19	mg/l	1.19	mg/l	M	5.6E-008	mg/kg-day	--	mg/kg-day	--
	(Total)										4.0E-008
TOTAL RISK ACROSS ALL PATHWAYS											2.3E-006

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- - Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable

400320

TABLE 8.3 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 6 - RR  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Aluminum	2.31	mg/l	2.31	mg/l	M	8.0E-008	mg/kg-day	--	mg/kg-day	--
	Antimony	0.0057	mg/l	0.0057	mg/l	M	1.6E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.02	mg/l	0.02	mg/l	M	5.2E-008	mg/kg-day	1.5E+000	mg/kg-day	7.8E-008
	Copper	0.249	mg/l	0.249	mg/l	M	6.6E-007	mg/kg-day	--	mg/kg-day	--
	Manganese	0.101	mg/l	0.101	mg/l	M	2.8E-007	mg/kg-day	--	mg/kg-day	--
	Thallium	0.005	mg/l	0.005	mg/l	M	1.3E-008	mg/kg-day	--	mg/kg-day	--
	Vanadium	0.0186	mg/l	0.0186	mg/l	M	4.8E-008	mg/kg-day	--	mg/kg-day	--
	(Total)										7.8E-008
Dermal	Aluminum	2.31	mg/l	2.31	mg/l	M	1.1E-007	mg/kg-day	--	mg/kg-day	--
	Antimony	0.0057	mg/l	0.0057	mg/l	M	2.7E-010	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.02	mg/l	0.02	mg/l	M	9.4E-010	mg/kg-day	1.5E+000	mg/kg-day	1.4E-009
	Copper	0.249	mg/l	0.249	mg/l	M	1.2E-008	mg/kg-day	--	mg/kg-day	--
	Manganese	0.101	mg/l	0.101	mg/l	M	4.7E-009	mg/kg-day	--	mg/kg-day	--
	Thallium	0.005	mg/l	0.005	mg/l	M	2.4E-010	mg/kg-day	--	mg/kg-day	--
	Vanadium	0.0186	mg/l	0.0186	mg/l	M	8.7E-010	mg/kg-day	--	mg/kg-day	--
	(Total)										1.4E-009
TOTAL RISK ACROSS ALL PATHWAYS											7.9E-008

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated

N/A - Not Applicable

400321

TABLE 8.4 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Shellfish  
Exposure Point: AOC 5 - DSM  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	0.568	mg/l	25	mg/kg	R	7.8E-008	mg/kg-day	1.5E+000	mg/kg-day	1.2E-008
	Manganese	1.19	mg/l	714	mg/kg	R	2.2E-007	mg/kg-day	-	mg/kg-day	-
	(Total)										1.2E-008
TOTAL RISK ACROSS ALL PATHWAYS											1.2E-008

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

- - Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.4 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Surface Water  
Exposure Medium: Shellfish  
Exposure Point: AOC 8 - RR  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Aluminum	2.31	mg/l	--	mg/kg	R	--	mg/kg-day	--	mg/kg-day	--
	Antimony	0.0057	mg/l	0.0057	mg/kg	R	1.8E-012	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.02	mg/l	0.88	mg/kg	R	2.7E-010	mg/kg-day	1.5E+000	mg/kg-day	4.1E-010
	Copper	0.249	mg/l	49.8	mg/kg	R	1.5E-008	mg/kg-day	--	mg/kg-day	--
	Manganese	0.101	mg/l	80.6	mg/kg	R	1.9E-008	mg/kg-day	--	mg/kg-day	--
	Thallium	0.005	mg/l	0.17	mg/kg	R	5.3E-011	mg/kg-day	--	mg/kg-day	--
	Vanadium	0.0186	mg/l	--	mg/kg	R	--	mg/kg-day	--	mg/kg-day	--
(Total)											4.1E-010
TOTAL RISK ACROSS ALL PATHWAYS											4.1E-010

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable

TABLE 8.5 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Antimony	21.4	mg/kg	21.4	mg/kg	M	2.1E-007	mg/kg-day	-	mg/kg-day	-
	Arsenic	1110	mg/kg	1110	mg/kg	M	1.1E-005	mg/kg-day	1.5E+000	mg/kg-day	1.7E-005
	Copper	5300	mg/kg	5300	mg/kg	M	5.3E-005	mg/kg-day	-	mg/kg-day	-
	Manganese	2080	mg/kg	2080	mg/kg	M	2.1E-005	mg/kg-day	-	mg/kg-day	-
	Thallium	3.3	mg/kg	3.3	mg/kg	M	3.3E-008	mg/kg-day	-	mg/kg-day	-
	(Total)										1.7E-005
Dermal	Antimony	21.4	mg/kg	21.4	mg/kg	M	2.0E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	1110	mg/kg	1110	mg/kg	M	3.1E-008	mg/kg-day	1.5E+000	mg/kg-day	4.7E-008
	Copper	5300	mg/kg	5300	mg/kg	M	5.0E-008	mg/kg-day	-	mg/kg-day	-
	Manganese	2080	mg/kg	2080	mg/kg	M	2.0E-008	mg/kg-day	-	mg/kg-day	-
	Thallium	3.3	mg/kg	3.3	mg/kg	M	3.1E-009	mg/kg-day	-	mg/kg-day	-
	(Total)										4.7E-008
Total Risk Across All Exposure Pathways											2.1E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

- - - Cancer Slope Factor not available, therefore Cancer Risk not calculated

N/A - Not Applicable

400324

TABLE 8.5 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 2 - ADC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)pyrene	6002	ug/kg	6002	ug/kg	M	8.0E-008	mg/kg-day	7.3E+000	mg/kg-day	4.4E-007
	Methoxychlor	640000	ug/kg	640000	ug/kg	M	6.4E-006	mg/kg-day	--	mg/kg-day	--
	Arsenic	3480	mg/kg	3480	mg/kg	M	3.5E-005	mg/kg-day	1.5E+000	mg/kg-day	5.2E-005
	(Total)										5.3E-005
Dermal	Benzo(a)pyrene	6002	ug/kg	6002	ug/kg	M	7.3E-008	mg/kg-day	7.3E+000	mg/kg-day	5.4E-007
	Methoxychlor	640000	ug/kg	640000	ug/kg	M	6.0E-006	mg/kg-day	--	mg/kg-day	--
	Arsenic	3480	mg/kg	3480	mg/kg	M	9.8E-006	mg/kg-day	1.5E+000	mg/kg-day	1.5E-005
	(Total)										1.5E-005
Total Risk Across All Exposure Pathways											6.8E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable



TABLE 8.5.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 3 - SPD  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(b)fluoranthene	910	ug/kg	910	ug/kg	M	9.1E-008	mg/kg-day	7.3E+001	mg/kg-day	6.6E-009
	Benzo(e)pyrene	630	ug/kg	630	ug/kg	M	6.3E-008	mg/kg-day	7.3E+000	mg/kg-day	4.6E-008
	Dibenz(a,h)anthracene	130	ug/kg	130	ug/kg	M	1.3E-008	mg/kg-day	7.3E+000	mg/kg-day	9.5E-009
	Aroclor 1254	68	ug/kg	68	ug/kg	M	6.8E-010	mg/kg-day	2.0E+000	mg/kg-day	1.4E-009
	Heptachlor	220	ug/kg	220	ug/kg	M	2.2E-008	mg/kg-day	4.5E+000	mg/kg-day	9.9E-009
	Methoxychlor	130000	ug/kg	130000	ug/kg	M	1.3E-008	mg/kg-day	-	mg/kg-day	-
	Aluminum	13800	mg/kg	13800	mg/kg	M	1.4E-007	mg/kg-day	-	mg/kg-day	-
	Antimony	2.3	mg/kg	2.3	mg/kg	M	2.3E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	21.8	mg/kg	21.8	mg/kg	M	2.2E-007	mg/kg-day	1.5E+000	mg/kg-day	1.5E-007
	Copper	816	mg/kg	816	mg/kg	M	8.2E-008	mg/kg-day	-	mg/kg-day	-
	Manganese	282	mg/kg	282	mg/kg	M	2.8E-008	mg/kg-day	-	mg/kg-day	-
	Vanadium	47.9	mg/kg	47.9	mg/kg	M	4.8E-007	mg/kg-day	-	mg/kg-day	-
	(Total)										2.2E-007
Dermal	Benzo(b)fluoranthene	910	ug/kg	910	ug/kg	M	1.1E-008	mg/kg-day	7.3E+001	mg/kg-day	8.1E-009
	Benzo(e)pyrene	630	ug/kg	630	ug/kg	M	7.7E-009	mg/kg-day	7.3E+000	mg/kg-day	5.6E-008
	Dibenz(a,h)anthracene	130	ug/kg	130	ug/kg	M	1.8E-009	mg/kg-day	7.3E+000	mg/kg-day	1.2E-008
	Aroclor 1254	68	ug/kg	68	ug/kg	M	8.8E-010	mg/kg-day	2.0E+000	mg/kg-day	1.8E-009
	Heptachlor	220	ug/kg	220	ug/kg	M	2.1E-009	mg/kg-day	4.5E+000	mg/kg-day	9.3E-009
	Methoxychlor	130000	ug/kg	130000	ug/kg	M	1.2E-008	mg/kg-day	-	mg/kg-day	-
	Aluminum	13800	mg/kg	13800	mg/kg	M	1.3E-005	mg/kg-day	-	mg/kg-day	-
	Antimony	2.3	mg/kg	2.3	mg/kg	M	2.2E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	21.8	mg/kg	21.8	mg/kg	M	6.1E-008	mg/kg-day	1.5E+000	mg/kg-day	4.1E-008
	Copper	816	mg/kg	816	mg/kg	M	7.7E-007	mg/kg-day	-	mg/kg-day	-
	Manganese	282	mg/kg	282	mg/kg	M	2.7E-007	mg/kg-day	-	mg/kg-day	-
	Vanadium	47.9	mg/kg	47.9	mg/kg	M	4.5E-008	mg/kg-day	-	mg/kg-day	-
	(Total)										1.3E-007
Total Risk Across All Exposure Pathways											3.5E-007

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.  
N/A - Not Applicable.

400326

TABLE 8.5 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 4 - ARC  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)pyrene	1000	ug/kg	1000	ug/kg	M	1.0E-008	mg/kg-day	7.3E+000	mg/kg-day	7.3E-008
	Dieldrin	41	ug/kg	41	ug/kg	M	4.1E-010	mg/kg-day	1.0E+001	mg/kg-day	8.0E-009
	Aroclor-1248	2100	ug/kg	2100	ug/kg	M	2.1E-008	mg/kg-day	2.0E+000	mg/kg-day	4.2E-008
	Aroclor-1254	57500	ug/kg	57500	ug/kg	M	5.8E-007	mg/kg-day	2.0E+000	mg/kg-day	1.2E-008
	Aroclor-1260	2100	ug/kg	2100	ug/kg	M	2.1E-008	mg/kg-day	2.0E+000	mg/kg-day	4.2E-008
	2,3,7,8-TCDD equiv	0.08	ug/kg	0.08	ug/kg	M	8.0E-013	mg/kg-day	1.5E+005	mg/kg-day	1.2E-007
	Antimony	26	mg/kg	26	mg/kg	M	2.0E-007	mg/kg-day	--	mg/kg-day	--
	Arsenic	49	mg/kg	49	mg/kg	M	4.0E-007	mg/kg-day	1.5E+000	mg/kg-day	7.4E-007
	Copper	1493	mg/kg	1493	mg/kg	M	1.5E-005	mg/kg-day	--	mg/kg-day	--
	Silver	321	mg/kg	321	mg/kg	M	3.2E-008	mg/kg-day	--	mg/kg-day	--
	(Total)										2.2E-006
Dermal	Benzo(a)pyrene	1000	ug/kg	1000	ug/kg	M	1.2E-008	mg/kg-day	7.3E+000	mg/kg-day	8.0E-008
	Dieldrin	41	ug/kg	41	ug/kg	M	3.0E-010	mg/kg-day	1.0E+001	mg/kg-day	8.2E-009
	Aroclor-1248	2100	ug/kg	2100	ug/kg	M	2.8E-008	mg/kg-day	2.0E+000	mg/kg-day	5.5E-008
	Aroclor-1254	57500	ug/kg	57500	ug/kg	M	7.0E-007	mg/kg-day	2.0E+000	mg/kg-day	1.5E-008
	Aroclor-1260	2100	ug/kg	2100	ug/kg	M	2.8E-008	mg/kg-day	2.0E+000	mg/kg-day	5.5E-008
	2,3,7,8-TCDD equiv	0.08	ug/kg	0.08	ug/kg	M	2.3E-013	mg/kg-day	1.5E+005	mg/kg-day	3.4E-008
	Antimony	26	mg/kg	26	mg/kg	M	2.4E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	49	mg/kg	49	mg/kg	M	1.4E-007	mg/kg-day	1.5E+000	mg/kg-day	2.1E-007
	Copper	1493	mg/kg	1493	mg/kg	M	1.4E-008	mg/kg-day	--	mg/kg-day	--
	Silver	321	mg/kg	321	mg/kg	M	3.0E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										2.0E-006
Total Risk Across All Exposure Pathways											4.1E-006

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- - Cancer Slope Factor not available, therefore Cancer Risk not calculated

N/A - Not Applicable

TABLE 8.5 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: ADC 5 - DSM  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	3.0E-008	mg/kg-day	7.3E-001	mg/kg-day	2.2E-008
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	7.3E-009	mg/kg-day	7.3E-001	mg/kg-day	5.3E-008
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	3.0E-009	mg/kg-day	7.3E+000	mg/kg-day	2.2E-008
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	2.2E-009	mg/kg-day	7.3E-001	mg/kg-day	1.6E-008
	Aroclor-1254	470	ug/kg	470	ug/kg	M	4.7E-009	mg/kg-day	2.0E+000	mg/kg-day	9.4E-008
	Arsenic	4030	mg/kg	4030	mg/kg	M	4.0E-005	mg/kg-day	1.5E+000	mg/kg-day	6.0E-005
	(Total)										8.0E-005
Dermal	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	3.7E-009	mg/kg-day	7.3E-001	mg/kg-day	2.7E-008
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	8.9E-009	mg/kg-day	7.3E-001	mg/kg-day	6.5E-008
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	3.7E-009	mg/kg-day	7.3E+000	mg/kg-day	2.7E-008
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	2.7E-009	mg/kg-day	7.3E-001	mg/kg-day	2.0E-008
	Aroclor-1254	470	ug/kg	470	ug/kg	M	6.2E-009	mg/kg-day	2.0E+000	mg/kg-day	1.2E-008
	Arsenic	4030	mg/kg	4030	ug/kg	M	1.1E-005	mg/kg-day	1.6E+000	mg/kg-day	1.7E-005
	(Total)										1.7E-005
Total Risk Across All Exposure Pathways											7.8E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated

N/A - Not Applicable

TABLE 8.5 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 8 - RR  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Arsenic	2200	mg/kg	2200	mg/kg	M	2.2E-005	mg/kg-day	1.5E+000	mg/kg-day	3.3E-005
	Copper	3560	mg/kg	3560	mg/kg	M	3.6E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										3.3E-005
Dermal	Arsenic	2200	mg/kg	2200	mg/kg	M	6.2E-006	mg/kg-day	1.5E+000	mg/kg-day	9.3E-006
	Copper	3560	mg/kg	3560	mg/kg	M	3.3E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										9.3E-006
Total Risk Across All Exposure Pathways											4.2E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- - Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable

400329

TABLE 6.6a RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Dieldrin	120	ug/kg	120	ug/kg	M	2.2E-008	mg/kg-day	1.8E+001	mg/kg-day	3.5E-007
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	1.7E-008	mg/kg-day	2.0E+000	mg/kg-day	3.4E-008
	Aroclor-1254	850	ug/kg	850	ug/kg	M	1.5E-007	mg/kg-day	2.0E+000	mg/kg-day	3.1E-007
	Aroclor-1280	720	ug/kg	720	ug/kg	M	1.3E-007	mg/kg-day	2.0E+000	mg/kg-day	2.8E-007
	Aluminum	14250	mg/kg	14250	mg/kg	M	2.6E-003	mg/kg-day	-	mg/kg-day	-
	Antimony	3.4	mg/kg	3.4	mg/kg	M	6.1E-007	mg/kg-day	-	mg/kg-day	-
	Arsenic	53	mg/kg	53	mg/kg	M	9.5E-008	mg/kg-day	1.5E+000	mg/kg-day	1.4E-005
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	8.1E-007	mg/kg-day	-	mg/kg-day	-
	Copper	433	mg/kg	433	mg/kg	M	7.8E-005	mg/kg-day	-	mg/kg-day	-
	Manganese	420	mg/kg	420	mg/kg	M	7.6E-005	mg/kg-day	-	mg/kg-day	-
	Nickel	108	mg/kg	108	mg/kg	M	1.9E-005	mg/kg-day	-	mg/kg-day	-
	Silver	30	mg/kg	30	mg/kg	M	5.4E-008	mg/kg-day	-	mg/kg-day	-
	Thallium	1	mg/kg	1	mg/kg	M	1.8E-007	mg/kg-day	-	mg/kg-day	-
	Vanadium	84	mg/kg	84	mg/kg	M	1.2E-005	mg/kg-day	-	mg/kg-day	-
	(Total)										1.8E-005
Dermal	Dieldrin	120	ug/kg	120	ug/kg	M	2.4E-007	mg/kg-day	1.8E+001	mg/kg-day	3.8E-008
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	2.7E-005	mg/kg-day	2.0E+000	mg/kg-day	5.3E-005
	Aroclor-1254	850	ug/kg	850	ug/kg	M	2.4E-008	mg/kg-day	2.0E+000	mg/kg-day	4.8E-008
	Aroclor-1280	720	ug/kg	720	ug/kg	M	2.0E-008	mg/kg-day	2.0E+000	mg/kg-day	4.0E-008
	Aluminum	14250	mg/kg	14250	mg/kg	M	2.9E-003	mg/kg-day	-	mg/kg-day	-
	Antimony	3.4	mg/kg	3.4	mg/kg	M	6.8E-007	mg/kg-day	-	mg/kg-day	-
	Arsenic	53	mg/kg	53	mg/kg	M	3.2E-005	mg/kg-day	1.5E+000	mg/kg-day	4.8E-005
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	9.0E-008	mg/kg-day	-	mg/kg-day	-
	Copper	433	mg/kg	433	mg/kg	M	8.7E-005	mg/kg-day	-	mg/kg-day	-
	Manganese	420	mg/kg	420	mg/kg	M	8.4E-005	mg/kg-day	-	mg/kg-day	-
	Nickel	108	mg/kg	108	mg/kg	M	2.2E-005	mg/kg-day	-	mg/kg-day	-
	Silver	30	mg/kg	30	mg/kg	M	8.0E-008	mg/kg-day	-	mg/kg-day	-
	Thallium	1	mg/kg	1	mg/kg	M	2.0E-007	mg/kg-day	-	mg/kg-day	-
	Vanadium	84	mg/kg	84	mg/kg	M	1.3E-005	mg/kg-day	-	mg/kg-day	-
	(Total)										1.1E-004
Total Risk Across All Exposure Pathways											1.3E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.  
N/A - Not Applicable

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TABLE 6 6a.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Dieldrin	24	ug/kg	24	ug/kg	M	5.5E-010	mg/kg-day	1.6E+001	mg/kg-day	8.8E-009
	Aroclor-1248	1678	ug/kg	1678	ug/kg	M	3.9E-008	mg/kg-day	2.0E+000	mg/kg-day	7.7E-008
	Aroclor-1254	396	ug/kg	396	ug/kg	M	9.1E-009	mg/kg-day	2.0E+000	mg/kg-day	1.8E-008
	Aroclor-1260	207	ug/kg	207	ug/kg	M	4.8E-009	mg/kg-day	2.0E+000	mg/kg-day	9.5E-009
	Aluminum	6975	mg/kg	6975	mg/kg	M	1.8E-004	mg/kg-day	-	mg/kg-day	-
	Antimony	2.1	mg/kg	2.1	mg/kg	M	4.8E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	30	mg/kg	30	mg/kg	M	6.9E-007	mg/kg-day	1.5E+000	mg/kg-day	1.0E-006
	Cadmium	2.3	mg/kg	2.3	mg/kg	M	5.3E-008	mg/kg-day	-	mg/kg-day	-
	Copper	186	mg/kg	186	mg/kg	M	4.3E-008	mg/kg-day	-	mg/kg-day	-
	Manganese	155	mg/kg	155	mg/kg	M	3.6E-008	mg/kg-day	-	mg/kg-day	-
	Nickel	44	mg/kg	44	mg/kg	M	1.0E-006	mg/kg-day	-	mg/kg-day	-
	Silver	16	mg/kg	16	mg/kg	M	3.7E-007	mg/kg-day	-	mg/kg-day	-
	Thallium	0.63	mg/kg	0.63	mg/kg	M	1.4E-008	mg/kg-day	-	mg/kg-day	-
	Vanadium	37	mg/kg	37	mg/kg	M	8.5E-007	mg/kg-day	-	mg/kg-day	-
	(Total)										1.1E-006
Dermal	Dieldrin	24	ug/kg	24	ug/kg	M	1.1E-006	mg/kg-day	1.6E+001	mg/kg-day	1.6E-007
	Aroclor-1248	1678	ug/kg	1678	ug/kg	M	1.1E-006	mg/kg-day	2.0E+000	mg/kg-day	2.2E-006
	Aroclor-1254	396	ug/kg	396	ug/kg	M	2.6E-007	mg/kg-day	2.0E+000	mg/kg-day	5.2E-007
	Aroclor-1260	207	ug/kg	207	ug/kg	M	1.4E-007	mg/kg-day	2.0E+000	mg/kg-day	2.7E-007
	Aluminum	6975	mg/kg	6975	mg/kg	M	3.3E-004	mg/kg-day	-	mg/kg-day	-
	Antimony	2.1	mg/kg	2.1	mg/kg	M	9.9E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	30	mg/kg	30	mg/kg	M	4.2E-006	mg/kg-day	1.5E+000	mg/kg-day	6.3E-006
	Cadmium	2.3	mg/kg	2.3	mg/kg	M	1.1E-008	mg/kg-day	-	mg/kg-day	-
	Copper	186	mg/kg	186	mg/kg	M	8.7E-006	mg/kg-day	-	mg/kg-day	-
	Manganese	155	mg/kg	155	mg/kg	M	7.3E-006	mg/kg-day	-	mg/kg-day	-
	Nickel	44	mg/kg	44	mg/kg	M	2.1E-006	mg/kg-day	-	mg/kg-day	-
	Silver	16	mg/kg	16	mg/kg	M	7.5E-007	mg/kg-day	-	mg/kg-day	-
	Thallium	0.63	mg/kg	0.63	mg/kg	M	3.0E-008	mg/kg-day	-	mg/kg-day	-
	Vanadium	37	mg/kg	37	mg/kg	M	1.7E-006	mg/kg-day	-	mg/kg-day	-
	(Total)										9.5E-006
Total Risk Across All Exposure Pathways											1.1E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

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TABLE 8.6a RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	21000	ug/kg	21000	ug/kg	M	3.8E-007	mg/kg-day	7.3E-001	mg/kg-day	2.8E-007
	Benzo(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	5.4E-008	mg/kg-day	7.3E-001	mg/kg-day	3.9E-008
	Benzo(e)pyrene	20000	ug/kg	20000	ug/kg	M	3.6E-008	mg/kg-day	7.3E+000	mg/kg-day	2.6E-005
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	2.2E-008	mg/kg-day	7.3E-001	mg/kg-day	1.6E-008
	Dibenzot(h)anthracene	2300	ug/kg	2300	ug/kg	M	4.1E-007	mg/kg-day	7.3E+000	mg/kg-day	3.0E-008
	Aldrin	400	ug/kg	400	ug/kg	M	7.2E-008	mg/kg-day	1.7E+001	mg/kg-day	1.2E-008
	Dieldrin	740	ug/kg	740	ug/kg	M	1.3E-007	mg/kg-day	1.6E+001	mg/kg-day	2.1E-008
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	1.8E-004	mg/kg-day	-	mg/kg-day	-
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	6.1E-008	mg/kg-day	2.0E+000	mg/kg-day	1.2E-005
	Aroclor-1260	2500	ug/kg	2500	ug/kg	M	4.5E-007	mg/kg-day	2.0E+000	mg/kg-day	9.0E-007
	2,3,7,8-TCDD equiv.	0.308	ug/kg	0.308	ug/kg	M	5.5E-011	mg/kg-day	1.5E+005	mg/kg-day	8.3E-008
	Antimony	32	mg/kg	32	mg/kg	M	5.8E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	3640	mg/kg	3640	mg/kg	M	8.6E-004	mg/kg-day	1.5E+000	mg/kg-day	4.4E-004
	(Total)										5.0E-004
Dermal	Benzo(a)anthracene	21000	ug/kg	21000	ug/kg	M	5.5E-005	mg/kg-day	7.3E-001	mg/kg-day	4.0E-005
	Benzo(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	7.8E-005	mg/kg-day	7.3E-001	mg/kg-day	5.7E-005
	Benzo(e)pyrene	20000	ug/kg	20000	ug/kg	M	5.2E-005	mg/kg-day	7.3E+000	mg/kg-day	3.8E-004
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	3.1E-005	mg/kg-day	7.3E-001	mg/kg-day	2.3E-005
	Dibenzot(h)anthracene	2300	ug/kg	2300	ug/kg	M	6.0E-008	mg/kg-day	7.3E+000	mg/kg-day	4.4E-005
	Aldrin	400	ug/kg	400	ug/kg	M	8.0E-007	mg/kg-day	1.7E+001	mg/kg-day	1.4E-005
	Dieldrin	740	ug/kg	740	ug/kg	M	1.5E-008	mg/kg-day	1.6E+001	mg/kg-day	2.4E-005
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	2.0E-003	mg/kg-day	-	mg/kg-day	-
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	9.5E-005	mg/kg-day	2.0E+000	mg/kg-day	1.9E-004
	Aroclor-1260	2500	ug/kg	2500	ug/kg	M	7.0E-008	mg/kg-day	2.0E+000	mg/kg-day	1.4E-005
	2,3,7,8-TCDD equiv.	0.308	ug/kg	0.308	ug/kg	M	1.8E-010	mg/kg-day	1.5E+005	mg/kg-day	2.8E-005
	Antimony	32	mg/kg	32	mg/kg	M	6.4E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	3640	mg/kg	3640	mg/kg	M	2.2E-008	mg/kg-day	1.5E+000	mg/kg-day	1.5E-008
	(Total)										8.1E-004
Total Risk Across All Exposure Pathways											1.3E-003

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated  
N/A - Not Applicable

TABLE 8 6a CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, BAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	4534	ug/kg	4534	ug/kg	M	1.0E-008	mg/kg-day	7.3E-001	mg/kg-day	7.8E-008
	Benzo(b)fluoranthene	7841	ug/kg	7841	ug/kg	M	1.8E-008	mg/kg-day	7.3E-001	mg/kg-day	1.3E-008
	Benzo(a)pyrene	5343	ug/kg	5343	ug/kg	M	1.2E-008	mg/kg-day	7.3E+000	mg/kg-day	9.0E-008
	Indeno(1,2,3-cd)pyrene	3251	ug/kg	3251	ug/kg	M	7.5E-009	mg/kg-day	7.3E-001	mg/kg-day	5.5E-009
	Dibenz(a,h)anthracene	2532	ug/kg	2532	ug/kg	M	5.8E-009	mg/kg-day	7.3E+000	mg/kg-day	4.3E-008
	Aldrin	114	ug/kg	114	ug/kg	M	2.8E-010	mg/kg-day	1.7E+001	mg/kg-day	4.5E-009
	Dieldrin	200	ug/kg	200	ug/kg	M	4.8E-010	mg/kg-day	1.8E+001	mg/kg-day	7.4E-009
	Methoxychlor	72823	ug/kg	72823	ug/kg	M	1.7E-007	mg/kg-day	-	mg/kg-day	-
	Aroclor-1248	7359	ug/kg	7359	ug/kg	M	1.7E-008	mg/kg-day	2.0E+000	mg/kg-day	3.4E-008
	Aroclor-1280	1500	ug/kg	1500	ug/kg	M	3.5E-009	mg/kg-day	2.0E+000	mg/kg-day	6.9E-009
	2,3,7,8-TCDD equiv.	0.15	ug/kg	0.15	ug/kg	M	3.5E-013	mg/kg-day	1.5E+005	mg/kg-day	5.2E-008
	Antimony	2.7	mg/kg	2.7	mg/kg	M	8.2E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	46	mg/kg	46	mg/kg	M	1.1E-008	mg/kg-day	1.5E+000	mg/kg-day	7.1E-007
	(Total)										8.7E-007
Dermal	Benzo(a)anthracene	4534	ug/kg	4534	ug/kg	M	2.8E-008	mg/kg-day	7.3E-001	mg/kg-day	2.0E-008
	Benzo(b)fluoranthene	7841	ug/kg	7841	ug/kg	M	4.8E-008	mg/kg-day	7.3E-001	mg/kg-day	3.5E-008
	Benzo(a)pyrene	5343	ug/kg	5343	ug/kg	M	3.3E-008	mg/kg-day	7.3E+000	mg/kg-day	2.4E-005
	Indeno(1,2,3-cd)pyrene	3251	ug/kg	3251	ug/kg	M	2.0E-008	mg/kg-day	7.3E-001	mg/kg-day	1.5E-008
	Dibenz(a,h)anthracene	2532	ug/kg	2532	ug/kg	M	1.5E-008	mg/kg-day	7.3E+000	mg/kg-day	1.1E-005
	Aldrin	114	ug/kg	114	ug/kg	M	5.4E-008	mg/kg-day	1.7E+001	mg/kg-day	9.1E-007
	Dieldrin	200	ug/kg	200	ug/kg	M	9.4E-008	mg/kg-day	1.8E+001	mg/kg-day	1.5E-008
	Methoxychlor	72823	ug/kg	72823	ug/kg	M	3.4E-005	mg/kg-day	-	mg/kg-day	-
	Aroclor-1248	7359	ug/kg	7359	ug/kg	M	4.8E-008	mg/kg-day	2.0E+000	mg/kg-day	9.7E-008
	Aroclor-1280	1500	ug/kg	1500	ug/kg	M	9.9E-007	mg/kg-day	2.0E+000	mg/kg-day	2.0E-008
	2,3,7,8-TCDD equiv.	0.15	ug/kg	0.15	ug/kg	M	2.1E-011	mg/kg-day	1.5E+005	mg/kg-day	3.2E-008
	Antimony	2.7	mg/kg	2.7	mg/kg	M	1.3E-007	mg/kg-day	-	mg/kg-day	-
	Arsenic	46	mg/kg	46	mg/kg	M	8.5E-008	mg/kg-day	1.5E+000	mg/kg-day	4.3E-008
	(Total)										6.4E-005
Total Risk Across All Exposure Pathways											6.5E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.  
N/A - Not Applicable.



TABLE 8.6a RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	3.1E-007	mg/kg-day	7.3E-001	mg/kg-day	2.2E-007
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	5.2E-007	mg/kg-day	7.3E-001	mg/kg-day	3.8E-007
	Benzo(a)pyrene	1468	ug/kg	1468	ug/kg	M	2.6E-007	mg/kg-day	7.3E+000	mg/kg-day	1.9E-006
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	2.3E-007	mg/kg-day	7.3E-001	mg/kg-day	1.7E-007
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	1.2E-004	mg/kg-day	--	mg/kg-day	--
	Aluminum	8432	mg/kg	8432	mg/kg	M	1.5E-003	mg/kg-day	--	mg/kg-day	--
	Antimony	17	mg/kg	17	mg/kg	M	3.1E-006	mg/kg-day	--	mg/kg-day	--
	Arsenic	24	mg/kg	24	mg/kg	M	4.3E-006	mg/kg-day	1.5E+000	mg/kg-day	6.5E-006
	Copper	1519	mg/kg	1519	mg/kg	M	2.7E-004	mg/kg-day	--	mg/kg-day	--
	Manganese	215	mg/kg	215	mg/kg	M	3.9E-005	mg/kg-day	--	mg/kg-day	--
	Thallium	0.92	mg/kg	0.92	mg/kg	M	1.7E-007	mg/kg-day	--	mg/kg-day	--
	Vanadium	37	mg/kg	37	mg/kg	M	6.7E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										9.2E-006
Dermal	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	4.4E-008	mg/kg-day	7.3E-001	mg/kg-day	3.2E-006
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	7.5E-006	mg/kg-day	7.3E-001	mg/kg-day	5.5E-006
	Benzo(a)pyrene	1468	ug/kg	1468	ug/kg	M	3.8E-006	mg/kg-day	7.3E+000	mg/kg-day	2.8E-005
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	3.4E-006	mg/kg-day	7.3E-001	mg/kg-day	2.5E-006
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	1.3E-003	mg/kg-day	--	mg/kg-day	--
	Aluminum	8432	mg/kg	8432	mg/kg	M	1.7E-003	mg/kg-day	--	mg/kg-day	--
	Antimony	17	mg/kg	17	mg/kg	M	3.4E-006	mg/kg-day	--	mg/kg-day	--
	Arsenic	24	mg/kg	24	mg/kg	M	1.4E-005	mg/kg-day	1.5E+000	mg/kg-day	2.2E-005
	Copper	1519	mg/kg	1519	mg/kg	M	3.0E-004	mg/kg-day	--	mg/kg-day	--
	Manganese	215	mg/kg	215	mg/kg	M	4.3E-005	mg/kg-day	--	mg/kg-day	--
	Thallium	0.92	mg/kg	0.92	mg/kg	M	1.8E-007	mg/kg-day	--	mg/kg-day	--
	Vanadium	37	mg/kg	37	mg/kg	M	7.4E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										8.1E-005
Total Risk Across All Exposure Pathways											7.0E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable

TABLE 8.8a RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzobifluoranthene	2600	ug/kg	2600	ug/kg	M	4.7E-007	mg/kg-day	7.3E-001	mg/kg-day	3.4E-007
	Benzo(a)pyrene	1800	ug/kg	1800	ug/kg	M	3.2E-007	mg/kg-day	7.3E+000	mg/kg-day	2.4E-006
	Hexachlorobutadiene	6800	ug/kg	6800	ug/kg	M	1.2E-008	mg/kg-day	7.8E-002	mg/kg-day	9.5E-008
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	1.0E-005	mg/kg-day	-	mg/kg-day	-
	Aldrin	22	ug/kg	22	ug/kg	M	4.0E-009	mg/kg-day	1.7E+001	mg/kg-day	8.7E-008
	Aroclor-1248	891	ug/kg	891	ug/kg	M	1.6E-007	mg/kg-day	2.0E+000	mg/kg-day	3.2E-007
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	3.5E-007	mg/kg-day	2.0E+000	mg/kg-day	7.0E-007
	Aroclor-1260	485	ug/kg	485	ug/kg	M	8.4E-008	mg/kg-day	2.0E+000	mg/kg-day	1.7E-007
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	3.6E-011	mg/kg-day	1.5E+005	mg/kg-day	5.4E-006
	Aluminum	15500	mg/kg	15500	mg/kg	M	2.8E-003	mg/kg-day	-	mg/kg-day	-
	Antimony	18	mg/kg	18	mg/kg	M	3.2E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	27	mg/kg	27	mg/kg	M	4.9E-008	mg/kg-day	1.5E+000	mg/kg-day	7.3E-008
	Cadmium	37	mg/kg	37	mg/kg	M	6.7E-008	mg/kg-day	-	mg/kg-day	-
	Copper	591	mg/kg	591	mg/kg	M	1.1E-004	mg/kg-day	-	mg/kg-day	-
	Manganese	481	mg/kg	481	mg/kg	M	8.3E-005	mg/kg-day	-	mg/kg-day	-
	Nickel	298	mg/kg	298	mg/kg	M	5.3E-005	mg/kg-day	-	mg/kg-day	-
	Silver	287	mg/kg	287	mg/kg	M	5.2E-005	mg/kg-day	-	mg/kg-day	-
	Thallium	0.72	mg/kg	0.72	mg/kg	M	1.3E-007	mg/kg-day	-	mg/kg-day	-
	Zinc	9172	mg/kg	9172	mg/kg	M	1.7E-003	mg/kg-day	-	mg/kg-day	-
	(Total)										1.7E-005
Dermal	Benzobifluoranthene	2600	ug/kg	2600	ug/kg	M	6.8E-008	mg/kg-day	7.3E-001	mg/kg-day	4.9E-006
	Benzo(a)pyrene	1800	ug/kg	1800	ug/kg	M	4.7E-008	mg/kg-day	7.3E+000	mg/kg-day	3.4E-005
	Hexachlorobutadiene	6800	ug/kg	6800	ug/kg	M	1.4E-005	mg/kg-day	7.8E-002	mg/kg-day	1.1E-006
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	1.1E-004	mg/kg-day	-	mg/kg-day	-
	Aldrin	22	ug/kg	22	ug/kg	M	4.4E-008	mg/kg-day	1.7E+001	mg/kg-day	7.5E-007
	Aroclor-1248	891	ug/kg	891	ug/kg	M	2.5E-008	mg/kg-day	2.0E+000	mg/kg-day	5.0E-008
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	5.4E-008	mg/kg-day	2.0E+000	mg/kg-day	1.1E-005
	Aroclor-1260	485	ug/kg	485	ug/kg	M	1.3E-008	mg/kg-day	2.0E+000	mg/kg-day	2.8E-008
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	1.2E-010	mg/kg-day	1.5E+005	mg/kg-day	1.8E-005
	Aluminum	15500	mg/kg	15500	mg/kg	M	3.1E-003	mg/kg-day	-	mg/kg-day	-
	Antimony	18	mg/kg	18	mg/kg	M	3.6E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	27	mg/kg	27	mg/kg	M	1.6E-005	mg/kg-day	1.5E+000	mg/kg-day	2.4E-005
	Cadmium	37	mg/kg	37	mg/kg	M	7.4E-007	mg/kg-day	-	mg/kg-day	-
	Copper	591	mg/kg	591	mg/kg	M	1.2E-004	mg/kg-day	-	mg/kg-day	-
	Manganese	481	mg/kg	481	mg/kg	M	9.2E-005	mg/kg-day	-	mg/kg-day	-
	Nickel	298	mg/kg	298	mg/kg	M	5.9E-005	mg/kg-day	-	mg/kg-day	-
	Silver	287	mg/kg	287	mg/kg	M	5.7E-005	mg/kg-day	-	mg/kg-day	-
	Thallium	0.72	mg/kg	0.72	mg/kg	M	1.4E-007	mg/kg-day	-	mg/kg-day	-
	Zinc	9172	mg/kg	9172	mg/kg	M	1.8E-003	mg/kg-day	-	mg/kg-day	-
	(Total)										1.0E-004
Total Risk Across All Exposure Pathways											1.2E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400335

TABLE 8.6a.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(b)fluoranthene	1684	ug/kg	1684	ug/kg	M	3.9E-008	mg/kg-day	7.3E-001	mg/kg-day	2.8E-008
	Benzo(a)pyrene	1640	ug/kg	1640	ug/kg	M	3.8E-008	mg/kg-day	7.3E+000	mg/kg-day	2.8E-007
	Hexachlorobutadiene	1879	ug/kg	1879	ug/kg	M	4.3E-008	mg/kg-day	7.8E-002	mg/kg-day	3.4E-009
	Hexachlorocyclopentadiene	846	ug/kg	846	ug/kg	M	1.9E-008	mg/kg-day	-	mg/kg-day	-
	Aldrin	1.6	ug/kg	1.6	ug/kg	M	3.7E-011	mg/kg-day	1.7E+001	mg/kg-day	6.3E-010
	Aroclor-1248	43	ug/kg	43	ug/kg	M	9.9E-010	mg/kg-day	2.0E+000	mg/kg-day	2.0E-009
	Aroclor-1254	62	ug/kg	62	ug/kg	M	1.4E-009	mg/kg-day	2.0E+000	mg/kg-day	2.9E-009
	Aroclor-1260	44	ug/kg	44	ug/kg	M	1.0E-009	mg/kg-day	2.0E+000	mg/kg-day	2.0E-009
	2,3,7,8-TCDD equiv.	0.12	ug/kg	0.12	ug/kg	M	2.8E-012	mg/kg-day	1.5E+006	mg/kg-day	4.1E-007
	Aluminum	6918	mg/kg	6918	mg/kg	M	1.6E-004	mg/kg-day	-	mg/kg-day	-
	Antimony	3.5	mg/kg	3.5	mg/kg	M	8.1E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	9.7	mg/kg	9.7	mg/kg	M	2.2E-007	mg/kg-day	1.5E+000	mg/kg-day	3.3E-007
	Cadmium	1.3	mg/kg	1.3	mg/kg	M	3.0E-008	mg/kg-day	-	mg/kg-day	-
	Copper	174	mg/kg	174	mg/kg	M	4.0E-008	mg/kg-day	-	mg/kg-day	-
	Manganese	123	mg/kg	123	mg/kg	M	2.8E-008	mg/kg-day	-	mg/kg-day	-
	Nickel	21	mg/kg	21	mg/kg	M	4.8E-007	mg/kg-day	-	mg/kg-day	-
	Silver	66	mg/kg	66	mg/kg	M	1.5E-008	mg/kg-day	-	mg/kg-day	-
	Thallium	0.53	mg/kg	0.53	mg/kg	M	1.2E-008	mg/kg-day	-	mg/kg-day	-
	Zinc	108	mg/kg	108	mg/kg	M	2.5E-008	mg/kg-day	-	mg/kg-day	-
	(Total)										1.1E-008
Dermal	Benzo(b)fluoranthene	1684	ug/kg	1684	ug/kg	M	1.0E-008	mg/kg-day	7.3E-001	mg/kg-day	7.6E-007
	Benzo(a)pyrene	1640	ug/kg	1640	ug/kg	M	1.0E-008	mg/kg-day	7.3E+000	mg/kg-day	7.3E-008
	Hexachlorobutadiene	1879	ug/kg	1879	ug/kg	M	8.8E-007	mg/kg-day	7.8E-002	mg/kg-day	6.9E-008
	Hexachlorocyclopentadiene	846	ug/kg	846	ug/kg	M	4.0E-007	mg/kg-day	-	mg/kg-day	-
	Aldrin	1.6	ug/kg	1.6	ug/kg	M	7.5E-010	mg/kg-day	1.7E+001	mg/kg-day	1.3E-008
	Aroclor-1248	43	ug/kg	43	ug/kg	M	2.8E-008	mg/kg-day	2.0E+000	mg/kg-day	5.7E-008
	Aroclor-1254	62	ug/kg	62	ug/kg	M	4.1E-008	mg/kg-day	2.0E+000	mg/kg-day	8.2E-008
	Aroclor-1260	44	ug/kg	44	ug/kg	M	2.9E-008	mg/kg-day	2.0E+000	mg/kg-day	5.8E-008
	2,3,7,8-TCDD equiv.	0.12	ug/kg	0.12	ug/kg	M	1.7E-011	mg/kg-day	1.5E+006	mg/kg-day	2.5E-006
	Aluminum	6918	mg/kg	6918	mg/kg	M	3.3E-004	mg/kg-day	-	mg/kg-day	-
	Antimony	3.5	mg/kg	3.5	mg/kg	M	1.6E-007	mg/kg-day	-	mg/kg-day	-
	Arsenic	9.7	mg/kg	9.7	mg/kg	M	1.4E-008	mg/kg-day	1.5E+000	mg/kg-day	2.1E-006
	Cadmium	1.3	mg/kg	1.3	mg/kg	M	6.1E-009	mg/kg-day	-	mg/kg-day	-
	Copper	174	mg/kg	174	mg/kg	M	8.2E-008	mg/kg-day	-	mg/kg-day	-
	Manganese	123	mg/kg	123	mg/kg	M	5.8E-008	mg/kg-day	-	mg/kg-day	-
	Nickel	21	mg/kg	21	mg/kg	M	9.9E-007	mg/kg-day	-	mg/kg-day	-
	Silver	66	mg/kg	66	mg/kg	M	3.1E-008	mg/kg-day	-	mg/kg-day	-
	Thallium	0.53	mg/kg	0.53	mg/kg	M	2.5E-008	mg/kg-day	-	mg/kg-day	-
	Zinc	108	mg/kg	108	mg/kg	M	5.1E-008	mg/kg-day	-	mg/kg-day	-
	(Total)										1.3E-008
Total Risk Across All Exposure Pathways											1.4E-008

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable

400336

TABLE 8.6b RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Aroclor-1248	1300	ug/kg	1300	ug/kg	M	2.3E-007	mg/kg-day	2.0E+000	mg/kg-day	4.7E-007
	Aroclor-1254	96	ug/kg	96	ug/kg	M	1.7E-008	mg/kg-day	2.0E+000	mg/kg-day	3.5E-008
	Aroclor-1260	3100	ug/kg	3100	ug/kg	M	5.6E-007	mg/kg-day	2.0E+000	mg/kg-day	1.1E-006
	Aluminum	10685	mg/kg	10685	mg/kg	M	1.8E-003	mg/kg-day	--	mg/kg-day	--
	Antimony	5.1	mg/kg	5.1	mg/kg	M	9.2E-007	mg/kg-day	--	mg/kg-day	--
	Arsenic	24.5	mg/kg	24.5	mg/kg	M	4.4E-006	mg/kg-day	1.5E+000	mg/kg-day	6.6E-006
	Cadmium	4.4	mg/kg	4.4	mg/kg	M	7.8E-007	mg/kg-day	--	mg/kg-day	--
	Copper	1222	mg/kg	1222	mg/kg	M	2.2E-004	mg/kg-day	--	mg/kg-day	--
	Manganese	486	mg/kg	486	mg/kg	M	8.7E-005	mg/kg-day	--	mg/kg-day	--
	Nickel	174	mg/kg	174	mg/kg	M	3.1E-005	mg/kg-day	--	mg/kg-day	--
	Thallium	2.5	mg/kg	2.5	mg/kg	M	4.6E-007	mg/kg-day	--	mg/kg-day	--
	Vanadium	50	mg/kg	50	mg/kg	M	9.0E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										8.2E-006
Dermal	Aroclor-1248	1300	ug/kg	1300	ug/kg	M	3.6E-006	mg/kg-day	2.0E+000	mg/kg-day	7.3E-006
	Aroclor-1254	96	ug/kg	96	ug/kg	M	2.7E-007	mg/kg-day	2.0E+000	mg/kg-day	5.4E-007
	Aroclor-1260	3100	ug/kg	3100	ug/kg	M	8.7E-006	mg/kg-day	2.0E+000	mg/kg-day	1.7E-005
	Aluminum	10685	mg/kg	10685	mg/kg	M	2.1E-003	mg/kg-day	--	mg/kg-day	--
	Antimony	5.1	mg/kg	5.1	mg/kg	M	1.0E-006	mg/kg-day	--	mg/kg-day	--
	Arsenic	24.5	mg/kg	24.5	mg/kg	M	1.5E-005	mg/kg-day	1.5E+000	mg/kg-day	2.2E-005
	Cadmium	4.4	mg/kg	4.4	mg/kg	M	8.8E-008	mg/kg-day	--	mg/kg-day	--
	Copper	1222	mg/kg	1222	mg/kg	M	2.4E-004	mg/kg-day	--	mg/kg-day	--
	Manganese	486	mg/kg	486	mg/kg	M	9.7E-005	mg/kg-day	--	mg/kg-day	--
	Nickel	174	mg/kg	174	mg/kg	M	3.5E-005	mg/kg-day	--	mg/kg-day	--
	Thallium	2.5	mg/kg	2.5	mg/kg	M	5.0E-007	mg/kg-day	--	mg/kg-day	--
	Vanadium	50	mg/kg	50	mg/kg	M	1.0E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										4.7E-005
Total Risk Across All Exposure Routes/Pathways											5.5E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated

N/A - Not Applicable

400337

TABLE 8.6b.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Benzo(a)pyrene	1346	ug/kg	1346	ug/kg	M	2.4E-007	mg/kg-day	7.3E+000	mg/kg-day	1.8E-008
	Aroclor-1248	41000	ug/kg	41000	ug/kg	M	7.4E-008	mg/kg-day	2.0E+000	mg/kg-day	1.5E-005
	Aroclor-1254	6200	ug/kg	6200	ug/kg	M	1.1E-008	mg/kg-day	2.0E+000	mg/kg-day	2.2E-008
	Antimony	1308	mg/kg	1308	mg/kg	M	2.4E-004	mg/kg-day	-	mg/kg-day	-
	Arsenic	707	mg/kg	707	mg/kg	M	1.3E-004	mg/kg-day	1.5E+000	mg/kg-day	1.9E-004
	(Total)										2.1E-004
Dermal	Benzo(a)pyrene	1346	ug/kg	1346	ug/kg	M	3.5E-008	mg/kg-day	7.3E+000	mg/kg-day	2.6E-005
	Aroclor-1248	41000	ug/kg	41000	ug/kg	M	1.1E-004	mg/kg-day	2.0E+000	mg/kg-day	2.3E-004
	Aroclor-1254	6200	ug/kg	6200	ug/kg	M	1.7E-005	mg/kg-day	2.0E+000	mg/kg-day	3.5E-005
	Antimony	1308	mg/kg	1308	mg/kg	M	2.6E-004	mg/kg-day	-	mg/kg-day	-
	Arsenic	707	mg/kg	707	mg/kg	M	4.2E-004	mg/kg-day	1.5E+000	mg/kg-day	6.4E-004
	(Total)										9.3E-004
Total Risk Across All Exposure Routes/Pathways											1.1E-003

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.6b.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Benzo(a)pyrene	184	ug/kg	184	ug/kg	M	4.2E-008	mg/kg-day	7.3E+000	mg/kg-day	3.1E-008
	Aroclor-1248	3882	ug/kg	3882	ug/kg	M	8.9E-008	mg/kg-day	2.0E+000	mg/kg-day	1.8E-007
	Aroclor-1254	1105	ug/kg	1105	ug/kg	M	2.5E-008	mg/kg-day	2.0E+000	mg/kg-day	5.1E-008
	Antimony	3.2	mg/kg	3.2	mg/kg	M	7.4E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	33	mg/kg	33	mg/kg	M	7.6E-007	mg/kg-day	1.5E+000	mg/kg-day	1.1E-006
	(Total)										1.4E-006
Dermal	Benzo(a)pyrene	184	ug/kg	184	ug/kg	M	1.1E-007	mg/kg-day	7.3E+000	mg/kg-day	8.2E-007
	Aroclor-1248	3882	ug/kg	3882	ug/kg	M	2.6E-006	mg/kg-day	2.0E+000	mg/kg-day	5.1E-006
	Aroclor-1254	1105	ug/kg	1105	ug/kg	M	7.3E-007	mg/kg-day	2.0E+000	mg/kg-day	1.5E-006
	Antimony	3.2	mg/kg	3.2	mg/kg	M	1.5E-007	mg/kg-day	-	mg/kg-day	-
	Arsenic	33	mg/kg	33	mg/kg	M	4.7E-006	mg/kg-day	1.5E+000	mg/kg-day	7.0E-006
	(Total)										1.4E-005
Total Risk Across All Exposure Routes/Pathways											1.6E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.6b RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	1,2-Dichloroethane	390000	ug/kg	390000	ug/kg	M	7.0E-005	mg/kg-day	9.1E-002	mg/kg-day	6.4E-006
	Benzo(b)fluoranthene	3149	ug/kg	3149	ug/kg	M	5.7E-007	mg/kg-day	7.3E-001	mg/kg-day	4.1E-007
	Benzo(a)pyrene	4713	ug/kg	4713	ug/kg	M	8.5E-007	mg/kg-day	7.3E+000	mg/kg-day	6.2E-006
	Methoxychlor	760000	ug/kg	760000	ug/kg	M	1.4E-004	mg/kg-day	--	mg/kg-day	--
	Aroclor-1242	10538	ug/kg	10538	ug/kg	M	1.9E-006	mg/kg-day	2.0E+000	mg/kg-day	3.8E-006
	Aroclor-1248	74000	ug/kg	74000	ug/kg	M	1.3E-005	mg/kg-day	2.0E+000	mg/kg-day	2.7E-005
	Arsenic	828	mg/kg	828	mg/kg	M	1.5E-004	mg/kg-day	1.5E+000	mg/kg-day	2.2E-004
	Thallium	1.8	mg/kg	1.8	mg/kg	M	3.2E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										2.7E-004
Dermal	1,2-Dichloroethane	390000	ug/kg	390000	ug/kg	M	7.8E-003	mg/kg-day	9.1E-002	mg/kg-day	7.1E-004
	Benzo(b)fluoranthene	3149	ug/kg	3149	ug/kg	M	8.2E-006	mg/kg-day	7.3E-001	mg/kg-day	6.0E-006
	Benzo(a)pyrene	4713	ug/kg	4713	ug/kg	M	1.2E-005	mg/kg-day	7.3E+000	mg/kg-day	8.9E-005
	Methoxychlor	760000	ug/kg	760000	ug/kg	M	1.5E-003	mg/kg-day	--	mg/kg-day	--
	Aroclor-1242	10538	ug/kg	10538	ug/kg	M	3.0E-005	mg/kg-day	2.0E+000	mg/kg-day	5.9E-005
	Aroclor-1248	74000	ug/kg	74000	ug/kg	M	2.1E-004	mg/kg-day	2.0E+000	mg/kg-day	4.1E-004
	Arsenic	828	mg/kg	828	mg/kg	M	5.0E-004	mg/kg-day	1.5E+000	mg/kg-day	7.5E-004
	Thallium	1.8	mg/kg	1.8	mg/kg	M	3.6E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										2.0E-003
Total Risk Across All Exposure Routes/Pathways											2.3E-003

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- - Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.6b.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	1,2-Dichloroethane	28703	ug/kg	28703	ug/kg	M	6.1E-007	mg/kg-day	9.1E-002	mg/kg-day	5.8E-008
	Benzo(b)fluoranthene	490	ug/kg	490	ug/kg	M	1.1E-008	mg/kg-day	7.3E-001	mg/kg-day	8.2E-009
	Benzo(a)pyrene	563	ug/kg	563	ug/kg	M	1.3E-008	mg/kg-day	7.3E+000	mg/kg-day	9.5E-008
	Methoxychlor	64833	ug/kg	64833	ug/kg	M	1.5E-008	mg/kg-day	-	mg/kg-day	-
	Aroclor-1242	78.8	ug/kg	78.8	ug/kg	M	1.8E-009	mg/kg-day	2.0E+000	mg/kg-day	3.5E-009
	Aroclor-1248	7261	ug/kg	7261	ug/kg	M	1.7E-007	mg/kg-day	2.0E+000	mg/kg-day	3.3E-007
	Arsenic	21	mg/kg	21	mg/kg	M	4.8E-007	mg/kg-day	1.5E+000	mg/kg-day	7.2E-007
	Thallium	1	mg/kg	1	mg/kg	M	2.3E-008	mg/kg-day	-	mg/kg-day	-
	(Total)										1.2E-008
Dermal	1,2-Dichloroethane	28703	ug/kg	28703	ug/kg	M	1.3E-004	mg/kg-day	9.1E-002	mg/kg-day	1.1E-005
	Benzo(b)fluoranthene	490	ug/kg	490	ug/kg	M	3.0E-007	mg/kg-day	7.3E-001	mg/kg-day	2.2E-007
	Benzo(a)pyrene	563	ug/kg	563	ug/kg	M	3.4E-007	mg/kg-day	7.3E+000	mg/kg-day	2.5E-008
	Methoxychlor	64833	ug/kg	64833	ug/kg	M	3.0E-005	mg/kg-day	-	mg/kg-day	-
	Aroclor-1242	78.8	ug/kg	78.8	ug/kg	M	5.1E-008	mg/kg-day	2.0E+000	mg/kg-day	1.0E-007
	Aroclor-1248	7261	ug/kg	7261	ug/kg	M	4.8E-008	mg/kg-day	2.0E+000	mg/kg-day	9.8E-008
	Arsenic	21	mg/kg	21	mg/kg	M	3.0E-008	mg/kg-day	1.5E+000	mg/kg-day	4.4E-008
	Thallium	1	mg/kg	1	mg/kg	M	4.7E-008	mg/kg-day	-	mg/kg-day	-
	(Total)										2.8E-005
Total Risk Across All Exposure Routes/Pathways											2.9E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.



TABLE 8.6b.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Benzo(a)pyrene	93	ug/kg	93	ug/kg	M	1.7E-008	mg/kg-day	7.3E+000	mg/kg-day	1.2E-007
	Aroclor-1254	164	ug/kg	164	ug/kg	M	3.0E-008	mg/kg-day	2.0E+000	mg/kg-day	5.9E-008
	Aroclor-1260	176	ug/kg	176	ug/kg	M	3.2E-008	mg/kg-day	2.0E+000	mg/kg-day	6.3E-008
	Methoxychlor	18000	ug/kg	18000	ug/kg	M	3.2E-006	mg/kg-day	--	mg/kg-day	--
	Aluminum	9082	mg/kg	9082	mg/kg	M	1.6E-003	mg/kg-day	--	mg/kg-day	--
	Antimony	0.83	mg/kg	0.83	mg/kg	M	1.5E-007	mg/kg-day	--	mg/kg-day	--
	Arsenic	29	mg/kg	29	mg/kg	M	5.2E-006	mg/kg-day	1.5E+000	mg/kg-day	7.8E-006
	Cadmium	0.67	mg/kg	0.67	mg/kg	M	1.2E-007	mg/kg-day	--	mg/kg-day	--
	Manganese	197	mg/kg	197	mg/kg	M	3.5E-005	mg/kg-day	--	mg/kg-day	--
	Thallium	1.2	mg/kg	1.2	mg/kg	M	2.2E-007	mg/kg-day	--	mg/kg-day	--
	Vanadium	33	mg/kg	33	mg/kg	M	5.9E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										8.1E-006
Dermal	Benzo(a)pyrene	93	ug/kg	93	ug/kg	M	2.4E-007	mg/kg-day	7.3E+000	mg/kg-day	1.8E-006
	Aroclor-1254	164	ug/kg	164	ug/kg	M	4.6E-007	mg/kg-day	2.0E+000	mg/kg-day	9.2E-007
	Aroclor-1260	176	ug/kg	176	ug/kg	M	4.9E-007	mg/kg-day	2.0E+000	mg/kg-day	9.9E-007
	Methoxychlor	18000	ug/kg	18000	ug/kg	M	3.6E-002	mg/kg-day	--	mg/kg-day	--
	Aluminum	9082	mg/kg	9082	mg/kg	M	1.8E-003	mg/kg-day	--	mg/kg-day	--
	Antimony	0.83	mg/kg	0.83	mg/kg	M	1.7E-007	mg/kg-day	--	mg/kg-day	--
	Arsenic	29	mg/kg	29	mg/kg	M	1.7E-005	mg/kg-day	1.5E+000	mg/kg-day	2.6E-005
	Cadmium	0.67	mg/kg	0.67	mg/kg	M	1.3E-008	mg/kg-day	--	mg/kg-day	--
	Manganese	197	mg/kg	197	mg/kg	M	3.9E-005	mg/kg-day	--	mg/kg-day	--
	Thallium	1.2	mg/kg	1.2	mg/kg	M	2.4E-007	mg/kg-day	--	mg/kg-day	--
	Vanadium	33	mg/kg	33	mg/kg	M	6.6E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										3.0E-005
Total Risk Across All Exposure Routes/Pathways											3.8E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.6b.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Hexachloroethane	10,201,148	ug/kg	10,201,148	ug/kg	M	1.8E-003	mg/kg-day	1.4E-002	mg/kg-day	2.6E-005
	Benzo(a)pyrene	4700	ug/kg	4700	ug/kg	M	8.5E-007	mg/kg-day	7.3E+000	mg/kg-day	6.2E-006
	Dibenzo(a,h)anthracene	920	ug/kg	920	ug/kg	M	1.7E-007	mg/kg-day	7.3E+000	mg/kg-day	1.2E-006
	Aroclor-1248	21000	ug/kg	21000	ug/kg	M	3.8E-006	mg/kg-day	2.0E+000	mg/kg-day	7.6E-006
	Aroclor-1254	6000	ug/kg	6000	ug/kg	M	1.1E-006	mg/kg-day	2.0E+000	mg/kg-day	2.2E-006
	Arsenic	77	mg/kg	77	mg/kg	M	1.4E-005	mg/kg-day	1.5E+000	mg/kg-day	2.1E-005
	Copper	32300	mg/kg	32300	mg/kg	M	5.8E-003	mg/kg-day	--	mg/kg-day	--
	(Total)										6.4E-005
Dermal	Hexachloroethane	10,201,148	ug/kg	10,201,148	ug/kg	M	2.0E-002	mg/kg-day	1.4E-002	mg/kg-day	2.9E-004
	Benzo(a)pyrene	4700	ug/kg	4700	ug/kg	M	1.2E-005	mg/kg-day	7.3E+000	mg/kg-day	8.9E-005
	Dibenzo(a,h)anthracene	920	ug/kg	920	ug/kg	M	2.4E-006	mg/kg-day	7.3E+000	mg/kg-day	1.7E-005
	Aroclor-1248	21000	ug/kg	21000	ug/kg	M	5.9E-005	mg/kg-day	2.0E+000	mg/kg-day	1.2E-004
	Aroclor-1254	6000	ug/kg	6000	ug/kg	M	1.7E-005	mg/kg-day	2.0E+000	mg/kg-day	3.4E-005
	Arsenic	77	mg/kg	77	mg/kg	M	4.6E-005	mg/kg-day	1.5E+000	mg/kg-day	6.9E-005
	Copper	32300	mg/kg	32300	mg/kg	M	6.5E-003	mg/kg-day	--	mg/kg-day	--
	(Total)										6.1E-004
Total Risk Across All Exposure Routes/Pathways											6.8E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.6b.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Hexachloroethane	1751	ug/kg	1751	ug/kg	M	4.0E-008	mg/kg-day	1.4E-002	mg/kg-day	5.6E-010
	Benzo(a)pyrene	2000	ug/kg	2000	ug/kg	M	4.6E-008	mg/kg-day	7.3E+000	mg/kg-day	3.4E-007
	Dibenzo(a,h)anthracene	920	ug/kg	920	ug/kg	M	2.1E-008	mg/kg-day	7.3E+000	mg/kg-day	1.5E-007
	Aroclor-1248	3331	ug/kg	3331	ug/kg	M	7.7E-008	mg/kg-day	2.0E+000	mg/kg-day	1.5E-007
	Aroclor-1254	764	ug/kg	764	ug/kg	M	1.8E-008	mg/kg-day	2.0E+000	mg/kg-day	3.5E-008
	Arsenic	21.5	mg/kg	21.5	mg/kg	M	4.9E-007	mg/kg-day	1.5E+000	mg/kg-day	7.4E-007
	Copper	3502	mg/kg	3502	mg/kg	M	8.1E-005	mg/kg-day	-	mg/kg-day	-
	(Total)										1.4E-006
Dermal	Hexachloroethane	1751	ug/kg	1751	ug/kg	M	8.2E-007	mg/kg-day	1.4E-002	mg/kg-day	1.2E-008
	Benzo(a)pyrene	2000	ug/kg	2000	ug/kg	M	1.2E-006	mg/kg-day	7.3E+000	mg/kg-day	8.9E-006
	Dibenzo(a,h)anthracene	920	ug/kg	920	ug/kg	M	5.6E-007	mg/kg-day	7.3E+000	mg/kg-day	4.1E-006
	Aroclor-1248	3331	ug/kg	3331	ug/kg	M	2.2E-006	mg/kg-day	2.0E+000	mg/kg-day	4.4E-006
	Aroclor-1254	764	ug/kg	764	ug/kg	M	5.0E-007	mg/kg-day	2.0E+000	mg/kg-day	1.0E-006
	Arsenic	21.5	mg/kg	21.5	mg/kg	M	3.0E-006	mg/kg-day	1.5E+000	mg/kg-day	4.5E-006
	Copper	3502	mg/kg	3502	mg/kg	M	1.6E-004	mg/kg-day	-	mg/kg-day	-
	(Total)										2.3E-005
Total Risk Across All Exposure Routes/Pathways											2.4E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.6b RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Tetrachloroethene	19252	ug/kg	19252	ug/kg	M	3.5E-006	mg/kg-day	5.2E-002	mg/kg-day	1.8E-007
	Chlorobenzene	29736	ug/kg	29736	ug/kg	M	5.4E-006	mg/kg-day	-	mg/kg-day	-
	Benzo(a)anthracene	793	ug/kg	793	ug/kg	M	1.4E-007	mg/kg-day	7.3E-001	mg/kg-day	1.0E-007
	Benzo(b)fluoranthene	830	ug/kg	830	ug/kg	M	1.5E-007	mg/kg-day	7.3E-001	mg/kg-day	1.1E-007
	Benzo(a)pyrene	767	ug/kg	767	ug/kg	M	1.4E-007	mg/kg-day	7.3E+000	mg/kg-day	1.0E-008
	Indeno(1,2,3-cd)pyrene	693	ug/kg	693	ug/kg	M	1.2E-007	mg/kg-day	7.3E-001	mg/kg-day	9.1E-008
	1,2,4-Trichlorobenzene	112687	ug/kg	112687	ug/kg	M	2.0E-005	mg/kg-day	-	mg/kg-day	-
	Aldrin	5.7	ug/kg	5.7	ug/kg	M	1.0E-009	mg/kg-day	1.7E+001	mg/kg-day	1.7E-008
	Aroclor-1248	149	ug/kg	149	ug/kg	M	2.7E-008	mg/kg-day	2.0E+000	mg/kg-day	5.4E-008
	Aroclor-1254	56	ug/kg	56	ug/kg	M	1.0E-008	mg/kg-day	2.0E+000	mg/kg-day	2.0E-008
	Aluminum	13018	mg/kg	13018	mg/kg	M	2.3E-003	mg/kg-day	-	mg/kg-day	-
	Antimony	2.1	mg/kg	2.1	mg/kg	M	3.8E-007	mg/kg-day	-	mg/kg-day	-
	Arsenic	13	mg/kg	13	mg/kg	M	2.3E-006	mg/kg-day	1.5E+000	mg/kg-day	3.5E-008
	Manganese	133	mg/kg	133	mg/kg	M	2.4E-005	mg/kg-day	-	mg/kg-day	-
	Thallium	1.1	mg/kg	1.1	mg/kg	M	2.0E-007	mg/kg-day	-	mg/kg-day	-
	Vanadium	43	mg/kg	43	mg/kg	M	7.7E-006	mg/kg-day	-	mg/kg-day	-
	(Total)										5.1E-006
Dermal	Tetrachloroethene	19252	ug/kg	19252	ug/kg	M	3.9E-004	mg/kg-day	5.2E-002	mg/kg-day	2.0E-005
	Chlorobenzene	29736	ug/kg	29736	ug/kg	M	5.9E-004	mg/kg-day	-	mg/kg-day	-
	Benzo(a)anthracene	793	ug/kg	793	ug/kg	M	2.1E-006	mg/kg-day	7.3E-001	mg/kg-day	1.5E-006
	Benzo(b)fluoranthene	830	ug/kg	830	ug/kg	M	2.2E-006	mg/kg-day	7.3E-001	mg/kg-day	1.6E-006
	Benzo(a)pyrene	767	ug/kg	767	ug/kg	M	2.0E-006	mg/kg-day	7.3E+000	mg/kg-day	1.5E-005
	Indeno(1,2,3-cd)pyrene	693	ug/kg	693	ug/kg	M	1.8E-006	mg/kg-day	7.3E-001	mg/kg-day	1.3E-006
	1,2,4-Trichlorobenzene	112687	ug/kg	112687	ug/kg	M	2.3E-004	mg/kg-day	-	mg/kg-day	-
	Aldrin	5.7	ug/kg	5.7	ug/kg	M	1.1E-008	mg/kg-day	1.7E+001	mg/kg-day	1.9E-007
	Aroclor-1248	149	ug/kg	149	ug/kg	M	4.2E-007	mg/kg-day	2.0E+000	mg/kg-day	8.3E-007
	Aroclor-1254	56	ug/kg	56	ug/kg	M	1.8E-007	mg/kg-day	2.0E+000	mg/kg-day	3.1E-007
	Aluminum	13018	mg/kg	13018	mg/kg	M	2.6E-003	mg/kg-day	-	mg/kg-day	-
	Antimony	2.1	mg/kg	2.1	mg/kg	M	4.2E-007	mg/kg-day	-	mg/kg-day	-
	Arsenic	13	mg/kg	13	mg/kg	M	7.8E-006	mg/kg-day	1.5E+000	mg/kg-day	1.2E-005
	Manganese	133	mg/kg	133	mg/kg	M	2.7E-005	mg/kg-day	-	mg/kg-day	-
	Thallium	1.1	mg/kg	1.1	mg/kg	M	2.2E-007	mg/kg-day	-	mg/kg-day	-
	Vanadium	43	mg/kg	43	mg/kg	M	8.8E-006	mg/kg-day	-	mg/kg-day	-
	(Total)										5.2E-005
Total Risk Across All Exposure Routes/Pathways											5.7E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

- - Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

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TABLE 8.7a.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Dieldrin	120	ug/kg	120	ug/kg	M	2.0E-009	mg/kg-day	1.8E+001	mg/kg-day	3.3E-008
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	1.6E-007	mg/kg-day	2.0E+000	mg/kg-day	3.2E-007
	Aroclor-1254	850	ug/kg	850	ug/kg	M	1.4E-008	mg/kg-day	2.0E+000	mg/kg-day	2.9E-008
	Aroclor-1260	720	ug/kg	720	ug/kg	M	1.2E-008	mg/kg-day	2.0E+000	mg/kg-day	2.4E-008
	Aluminum	14250	mg/kg	14250	mg/kg	M	2.4E-004	mg/kg-day	--	mg/kg-day	--
	Antimony	3.4	mg/kg	3.4	mg/kg	M	5.8E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	53	mg/kg	53	mg/kg	M	9.0E-007	mg/kg-day	1.5E+000	mg/kg-day	1.4E-006
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	7.7E-008	mg/kg-day	--	mg/kg-day	--
	Copper	433	mg/kg	433	mg/kg	M	7.4E-006	mg/kg-day	--	mg/kg-day	--
	Manganese	420	mg/kg	420	mg/kg	M	7.1E-006	mg/kg-day	--	mg/kg-day	--
	Nickel	108	mg/kg	108	mg/kg	M	1.8E-006	mg/kg-day	--	mg/kg-day	--
	Silver	30	mg/kg	30	mg/kg	M	5.1E-007	mg/kg-day	--	mg/kg-day	--
	Thallium	1	mg/kg	1	mg/kg	M	1.7E-008	mg/kg-day	--	mg/kg-day	--
	Vanadium	64	mg/kg	64	mg/kg	M	1.1E-008	mg/kg-day	--	mg/kg-day	--
	(Total)										1.8E-006
Dermal	Dieldrin	120	ug/kg	120	ug/kg	M	2.6E-009	mg/kg-day	1.8E+001	mg/kg-day	4.2E-008
	Aroclor-1248	9500	ug/kg	9500	ug/kg	M	2.9E-007	mg/kg-day	2.0E+000	mg/kg-day	5.9E-007
	Aroclor-1254	850	ug/kg	850	ug/kg	M	2.6E-008	mg/kg-day	2.0E+000	mg/kg-day	5.2E-008
	Aroclor-1260	720	ug/kg	720	ug/kg	M	2.2E-008	mg/kg-day	2.0E+000	mg/kg-day	4.4E-008
	Aluminum	14250	mg/kg	14250	mg/kg	M	3.1E-005	mg/kg-day	--	mg/kg-day	--
	Antimony	3.4	mg/kg	3.4	mg/kg	M	7.5E-009	mg/kg-day	--	mg/kg-day	--
	Arsenic	53	mg/kg	53	mg/kg	M	3.5E-007	mg/kg-day	1.5E+000	mg/kg-day	5.2E-007
	Cadmium	4.5	mg/kg	4.5	mg/kg	M	9.9E-010	mg/kg-day	--	mg/kg-day	--
	Copper	433	mg/kg	433	mg/kg	M	9.5E-007	mg/kg-day	--	mg/kg-day	--
	Manganese	420	mg/kg	420	mg/kg	M	9.2E-007	mg/kg-day	--	mg/kg-day	--
	Nickel	108	mg/kg	108	mg/kg	M	2.4E-007	mg/kg-day	--	mg/kg-day	--
	Silver	30	mg/kg	30	mg/kg	M	6.6E-008	mg/kg-day	--	mg/kg-day	--
	Thallium	1	mg/kg	1	mg/kg	M	2.2E-009	mg/kg-day	--	mg/kg-day	--
	Vanadium	64	mg/kg	64	mg/kg	M	1.4E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										1.2E-006
Total Risk Across All Exposure Pathways											3.0E-006

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.  
N/A - Not Applicable.

TABLE 8.7a.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	21000	ug/kg	21000	ug/kg	M	3.6E-007	mg/kg-day	7.3E-001	mg/kg-day	2.8E-007
	Benzo(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	5.1E-007	mg/kg-day	7.3E-001	mg/kg-day	3.7E-007
	Benzo(a)pyrene	20000	ug/kg	20000	ug/kg	M	3.4E-007	mg/kg-day	7.3E+000	mg/kg-day	2.5E-006
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	2.0E-007	mg/kg-day	7.3E-001	mg/kg-day	1.5E-007
	Dibenzo(a,h)anthracene	2300	ug/kg	2300	ug/kg	M	3.9E-008	mg/kg-day	7.3E+000	mg/kg-day	2.9E-007
	Aldrin	400	ug/kg	400	ug/kg	M	6.8E-008	mg/kg-day	1.7E+001	mg/kg-day	1.2E-007
	Dieldrin	740	ug/kg	740	ug/kg	M	1.3E-008	mg/kg-day	1.6E+001	mg/kg-day	2.0E-007
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	1.7E-005	mg/kg-day	-	mg/kg-day	-
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	5.8E-007	mg/kg-day	2.0E+000	mg/kg-day	1.2E-006
	Aroclor-1260	2500	ug/kg	2500	ug/kg	M	4.3E-008	mg/kg-day	2.0E+000	mg/kg-day	8.5E-008
	2,3,7,8-TCDD equiv.	0.308	ug/kg	0.308	ug/kg	M	5.2E-012	mg/kg-day	1.5E+005	mg/kg-day	7.9E-007
	Antimony	32	mg/kg	32	mg/kg	M	5.4E-007	mg/kg-day	-	mg/kg-day	-
	Arsenic	3640	mg/kg	3640	mg/kg	M	6.2E-005	mg/kg-day	1.5E+000	mg/kg-day	4.1E-005
	(Total)										4.7E-005
Dermal	Benzo(a)anthracene	21000	ug/kg	21000	ug/kg	M	6.0E-007	mg/kg-day	7.3E-001	mg/kg-day	4.4E-007
	Benzo(b)fluoranthene	30000	ug/kg	30000	ug/kg	M	8.6E-007	mg/kg-day	7.3E-001	mg/kg-day	6.3E-007
	Benzo(a)pyrene	20000	ug/kg	20000	ug/kg	M	5.7E-007	mg/kg-day	7.3E+000	mg/kg-day	4.2E-006
	Indeno(1,2,3-cd)pyrene	12000	ug/kg	12000	ug/kg	M	3.4E-007	mg/kg-day	7.3E-001	mg/kg-day	2.5E-007
	Dibenzo(a,h)anthracene	2300	ug/kg	2300	ug/kg	M	6.6E-008	mg/kg-day	7.3E+000	mg/kg-day	4.8E-007
	Aldrin	400	ug/kg	400	ug/kg	M	8.8E-008	mg/kg-day	1.7E+001	mg/kg-day	1.5E-007
	Dieldrin	740	ug/kg	740	ug/kg	M	1.8E-008	mg/kg-day	1.6E+001	mg/kg-day	2.6E-007
	Methoxychlor	980000	ug/kg	980000	ug/kg	M	2.2E-005	mg/kg-day	-	mg/kg-day	-
	Aroclor-1248	34000	ug/kg	34000	ug/kg	M	1.0E-006	mg/kg-day	2.0E+000	mg/kg-day	2.1E-006
	Aroclor-1260	2500	ug/kg	2500	ug/kg	M	7.7E-008	mg/kg-day	2.0E+000	mg/kg-day	1.5E-007
	2,3,7,8-TCDD equiv.	0.308	ug/kg	0.308	ug/kg	M	2.0E-012	mg/kg-day	1.5E+005	mg/kg-day	3.0E-007
	Antimony	32	mg/kg	32	mg/kg	M	7.0E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	3640	mg/kg	3640	mg/kg	M	2.4E-008	mg/kg-day	1.5E+000	mg/kg-day	1.8E-008
	(Total)										9.0E-006
Total Risk Across All Exposure Pathways											5.6E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.7a.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	2.9E-008	mg/kg-day	7.3E-001	mg/kg-day	2.1E-008
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	4.9E-008	mg/kg-day	7.3E-001	mg/kg-day	3.6E-008
	Benzo(a)pyrene	1468	ug/kg	1468	ug/kg	M	2.5E-008	mg/kg-day	7.3E+000	mg/kg-day	1.8E-007
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	2.2E-008	mg/kg-day	7.3E-001	mg/kg-day	1.6E-008
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	1.1E-005	mg/kg-day	--	mg/kg-day	--
	Aluminum	8432	mg/kg	8432	mg/kg	M	1.4E-004	mg/kg-day	--	mg/kg-day	--
	Antimony	17	mg/kg	17	mg/kg	M	2.9E-007	mg/kg-day	--	mg/kg-day	--
	Arsenic	24	mg/kg	24	mg/kg	M	4.1E-007	mg/kg-day	1.5E+000	mg/kg-day	6.1E-007
	Copper	1519	mg/kg	1519	mg/kg	M	2.6E-005	mg/kg-day	--	mg/kg-day	--
	Manganese	215	mg/kg	215	mg/kg	M	3.7E-008	mg/kg-day	--	mg/kg-day	--
	Thallium	0.92	mg/kg	0.92	mg/kg	M	1.6E-008	mg/kg-day	--	mg/kg-day	--
	Vanadium	37	mg/kg	37	mg/kg	M	6.3E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										8.7E-007
Dermal	Benzo(a)anthracene	1701	ug/kg	1701	ug/kg	M	4.9E-008	mg/kg-day	7.3E-001	mg/kg-day	3.6E-008
	Benzo(b)fluoranthene	2883	ug/kg	2883	ug/kg	M	8.2E-008	mg/kg-day	7.3E-001	mg/kg-day	6.0E-008
	Benzo(a)pyrene	1468	ug/kg	1468	ug/kg	M	4.2E-008	mg/kg-day	7.3E+000	mg/kg-day	3.1E-007
	Indeno(1,2,3-cd)pyrene	1302	ug/kg	1302	ug/kg	M	3.7E-008	mg/kg-day	7.3E-001	mg/kg-day	2.7E-008
	Methoxychlor	650000	ug/kg	650000	ug/kg	M	1.4E-005	mg/kg-day	--	mg/kg-day	--
	Aluminum	8432	mg/kg	8432	mg/kg	M	1.9E-005	mg/kg-day	--	mg/kg-day	--
	Antimony	17	mg/kg	17	mg/kg	M	3.7E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	24	mg/kg	24	mg/kg	M	1.6E-007	mg/kg-day	1.5E+000	mg/kg-day	2.4E-007
	Copper	1519	mg/kg	1519	mg/kg	M	3.3E-006	mg/kg-day	--	mg/kg-day	--
	Manganese	215	mg/kg	215	mg/kg	M	4.7E-007	mg/kg-day	--	mg/kg-day	--
	Thallium	0.92	mg/kg	0.92	mg/kg	M	2.0E-009	mg/kg-day	--	mg/kg-day	--
	Vanadium	37	mg/kg	37	mg/kg	M	8.1E-008	mg/kg-day	--	mg/kg-day	--
	(Total)										6.7E-007
Total Risk Across All Exposure Pathways											1.5E-006

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

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TABLE 8.7a.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Surface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(b)fluoranthene	2800	ug/kg	2800	ug/kg	M	4.4E-008	mg/kg-day	7.3E-001	mg/kg-day	3.2E-008
	Benzo(a)pyrene	1800	ug/kg	1800	ug/kg	M	3.1E-008	mg/kg-day	7.3E+000	mg/kg-day	2.2E-007
	Hexachlorobutadiene	6800	ug/kg	6800	ug/kg	M	1.2E-007	mg/kg-day	7.8E-002	mg/kg-day	9.0E-009
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	9.8E-007	mg/kg-day	-	mg/kg-day	-
	Aldrin	22	ug/kg	22	ug/kg	M	3.7E-010	mg/kg-day	1.7E+001	mg/kg-day	6.4E-009
	Aroclor-1248	891	ug/kg	891	ug/kg	M	1.5E-008	mg/kg-day	2.0E+000	mg/kg-day	3.0E-008
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	3.3E-008	mg/kg-day	2.0E+000	mg/kg-day	6.6E-008
	Aroclor-1260	465	ug/kg	465	ug/kg	M	7.9E-009	mg/kg-day	2.0E+000	mg/kg-day	1.6E-008
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	3.4E-012	mg/kg-day	1.5E+005	mg/kg-day	5.1E-007
	Aluminum	15500	mg/kg	15500	mg/kg	M	2.6E-004	mg/kg-day	-	mg/kg-day	-
	Antimony	18	mg/kg	18	mg/kg	M	3.1E-007	mg/kg-day	-	mg/kg-day	-
	Arsenic	27	mg/kg	27	mg/kg	M	4.6E-007	mg/kg-day	1.5E+000	mg/kg-day	6.9E-007
	Cadmium	37	mg/kg	37	mg/kg	M	6.3E-007	mg/kg-day	-	mg/kg-day	-
	Copper	591	mg/kg	591	mg/kg	M	1.0E-005	mg/kg-day	-	mg/kg-day	-
	Manganese	461	mg/kg	461	mg/kg	M	7.8E-006	mg/kg-day	-	mg/kg-day	-
	Nickel	296	mg/kg	296	mg/kg	M	5.0E-006	mg/kg-day	-	mg/kg-day	-
	Silver	287	mg/kg	287	mg/kg	M	4.9E-006	mg/kg-day	-	mg/kg-day	-
	Thallium	0.72	mg/kg	0.72	mg/kg	M	1.2E-008	mg/kg-day	-	mg/kg-day	-
	Zinc	9172	mg/kg	9172	mg/kg	M	1.6E-004	mg/kg-day	-	mg/kg-day	-
	(Total)										1.8E-006
Dermal	Benzo(b)fluoranthene	2800	ug/kg	2800	ug/kg	M	7.4E-008	mg/kg-day	7.3E-001	mg/kg-day	5.4E-008
	Benzo(a)pyrene	1800	ug/kg	1800	ug/kg	M	5.1E-008	mg/kg-day	7.3E+000	mg/kg-day	3.8E-007
	Hexachlorobutadiene	6800	ug/kg	6800	ug/kg	M	1.5E-007	mg/kg-day	7.8E-002	mg/kg-day	1.2E-008
	Hexachlorocyclopentadiene	57440	ug/kg	57440	ug/kg	M	1.3E-006	mg/kg-day	-	mg/kg-day	-
	Aldrin	22	ug/kg	22	ug/kg	M	4.8E-010	mg/kg-day	1.7E+001	mg/kg-day	8.2E-009
	Aroclor-1248	891	ug/kg	891	ug/kg	M	2.7E-008	mg/kg-day	2.0E+000	mg/kg-day	5.5E-008
	Aroclor-1254	1941	ug/kg	1941	ug/kg	M	6.0E-008	mg/kg-day	2.0E+000	mg/kg-day	1.2E-007
	Aroclor-1260	465	ug/kg	465	ug/kg	M	1.4E-008	mg/kg-day	2.0E+000	mg/kg-day	2.9E-008
	2,3,7,8-TCDD equiv.	0.2	ug/kg	0.2	ug/kg	M	1.3E-012	mg/kg-day	1.5E+005	mg/kg-day	2.0E-007
	Aluminum	15500	mg/kg	15500	mg/kg	M	3.4E-005	mg/kg-day	-	mg/kg-day	-
	Antimony	18	mg/kg	18	mg/kg	M	4.0E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	27	mg/kg	27	mg/kg	M	1.8E-007	mg/kg-day	1.5E+000	mg/kg-day	2.7E-007
	Cadmium	37	mg/kg	37	mg/kg	M	6.1E-009	mg/kg-day	-	mg/kg-day	-
	Copper	591	mg/kg	591	mg/kg	M	1.3E-006	mg/kg-day	-	mg/kg-day	-
	Manganese	461	mg/kg	461	mg/kg	M	1.0E-006	mg/kg-day	-	mg/kg-day	-
	Nickel	296	mg/kg	296	mg/kg	M	6.5E-007	mg/kg-day	-	mg/kg-day	-
	Silver	287	mg/kg	287	mg/kg	M	6.3E-007	mg/kg-day	-	mg/kg-day	-
	Thallium	0.72	mg/kg	0.72	mg/kg	M	1.6E-009	mg/kg-day	-	mg/kg-day	-
	Zinc	9172	mg/kg	9172	mg/kg	M	2.0E-005	mg/kg-day	-	mg/kg-day	-
	(Total)										1.1E-006
Total Risk Across All Exposure Pathways											2.7E-006

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.  
N/A - Not Applicable.



TABLE 8.7b.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Aroclor-1248	1300	ug/kg	1300	ug/kg	M	2.2E-008	mg/kg-day	2.0E+000	mg/kg-day	4.4E-008
	Aroclor-1254	96	ug/kg	96	ug/kg	M	1.6E-009	mg/kg-day	2.0E+000	mg/kg-day	3.3E-009
	Aroclor-1260	3100	ug/kg	3100	ug/kg	M	5.3E-008	mg/kg-day	2.0E+000	mg/kg-day	1.1E-007
	Aluminum	10685	mg/kg	10685	mg/kg	M	1.8E-004	mg/kg-day	--	mg/kg-day	--
	Antimony	5.1	mg/kg	5.1	mg/kg	M	8.7E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	24.5	mg/kg	24.5	mg/kg	M	4.2E-007	mg/kg-day	1.5E+000	mg/kg-day	6.2E-007
	Cadmium	4.4	mg/kg	4.4	mg/kg	M	7.5E-008	mg/kg-day	--	mg/kg-day	--
	Copper	1222	mg/kg	1222	mg/kg	M	2.1E-005	mg/kg-day	--	mg/kg-day	--
	Manganese	486	mg/kg	486	mg/kg	M	8.3E-006	mg/kg-day	--	mg/kg-day	--
	Nickel	174	mg/kg	174	mg/kg	M	3.0E-006	mg/kg-day	--	mg/kg-day	--
	Thallium	2.5	mg/kg	2.5	mg/kg	M	4.3E-008	mg/kg-day	--	mg/kg-day	--
	Vanadium	50	mg/kg	50	mg/kg	M	8.5E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										7.8E-007
Dermal	Aroclor-1248	1300	ug/kg	1300	ug/kg	M	4.0E-008	mg/kg-day	2.0E+000	mg/kg-day	8.0E-008
	Aroclor-1254	96	ug/kg	96	ug/kg	M	3.0E-009	mg/kg-day	2.0E+000	mg/kg-day	5.9E-009
	Aroclor-1260	3100	ug/kg	3100	ug/kg	M	9.5E-008	mg/kg-day	2.0E+000	mg/kg-day	1.9E-007
	Aluminum	10685	mg/kg	10685	mg/kg	M	2.4E-005	mg/kg-day	--	mg/kg-day	--
	Antimony	5.1	mg/kg	5.1	mg/kg	M	1.1E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	24.5	mg/kg	24.5	mg/kg	M	1.6E-007	mg/kg-day	1.5E+000	mg/kg-day	2.4E-007
	Cadmium	4.4	mg/kg	4.4	mg/kg	M	9.7E-010	mg/kg-day	--	mg/kg-day	--
	Copper	1222	mg/kg	1222	mg/kg	M	2.7E-006	mg/kg-day	--	mg/kg-day	--
	Manganese	486	mg/kg	486	mg/kg	M	1.1E-006	mg/kg-day	--	mg/kg-day	--
	Nickel	174	mg/kg	174	mg/kg	M	3.8E-007	mg/kg-day	--	mg/kg-day	--
	Thallium	2.5	mg/kg	2.5	mg/kg	M	5.5E-009	mg/kg-day	--	mg/kg-day	--
	Vanadium	50	mg/kg	50	mg/kg	M	1.1E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										5.2E-007
Total Risk Across All Exposure Routes/Pathways											1.3E-006

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.7b.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 1 - HRDD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Benzo(a)pyrene	1348	ug/kg	1348	ug/kg	M	2.3E-008	mg/kg-day	7.3E+000	mg/kg-day	1.7E-007
	Aroclor-1248	41000	ug/kg	41000	ug/kg	M	7.0E-007	mg/kg-day	2.0E+000	mg/kg-day	1.4E-008
	Aroclor-1254	8200	ug/kg	8200	ug/kg	M	1.1E-007	mg/kg-day	2.0E+000	mg/kg-day	2.1E-007
	Antimony	1308	mg/kg	1308	mg/kg	M	2.2E-005	mg/kg-day	-	mg/kg-day	-
	Arsenic	707	mg/kg	707	mg/kg	M	1.2E-005	mg/kg-day	1.5E+000	mg/kg-day	1.8E-005
	(Total)										2.0E-005
Dermal	Benzo(a)pyrene	1348	ug/kg	1348	ug/kg	M	3.8E-008	mg/kg-day	7.3E+000	mg/kg-day	2.8E-007
	Aroclor-1248	41000	ug/kg	41000	ug/kg	M	1.3E-008	mg/kg-day	2.0E+000	mg/kg-day	2.5E-008
	Aroclor-1254	8200	ug/kg	8200	ug/kg	M	1.9E-007	mg/kg-day	2.0E+000	mg/kg-day	3.8E-007
	Antimony	1308	mg/kg	1308	mg/kg	M	2.9E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	707	mg/kg	707	mg/kg	M	4.7E-008	mg/kg-day	1.5E+000	mg/kg-day	7.0E-008
	(Total)										1.0E-005
Total Risk Across All Exposure Routes/Pathways											3.0E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.  
N/A - Not Applicable.

400351

TABLE 8.7b RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 2 - ADC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	1,2-Dichloroethane	390000	ug/kg	390000	ug/kg	M	6.6E-006	mg/kg-day	9.1E-002	mg/kg-day	6.0E-007
	Benzo(b)fluoranthene	3149	ug/kg	3149	ug/kg	M	5.4E-008	mg/kg-day	7.3E-001	mg/kg-day	3.9E-008
	Benzo(a)pyrene	4713	ug/kg	4713	ug/kg	M	8.0E-008	mg/kg-day	7.3E+000	mg/kg-day	5.8E-007
	Methoxychlor	760000	ug/kg	760000	ug/kg	M	1.3E-005	mg/kg-day	--	mg/kg-day	--
	Aroclor-1242	10538	ug/kg	10538	ug/kg	M	1.8E-007	mg/kg-day	2.0E+000	mg/kg-day	3.6E-007
	Aroclor-1248	74000	ug/kg	74000	ug/kg	M	1.3E-006	mg/kg-day	2.0E+000	mg/kg-day	2.5E-006
	Arsenic	828	mg/kg	828	mg/kg	M	1.4E-005	mg/kg-day	1.5E+000	mg/kg-day	2.1E-005
	Thallium	1.8	mg/kg	1.8	mg/kg	M	3.1E-008	mg/kg-day	--	mg/kg-day	--
	(Total)										2.5E-005
Dermal	1,2-Dichloroethane	390000	ug/kg	390000	ug/kg	M	8.6E-005	mg/kg-day	9.1E-002	mg/kg-day	7.8E-006
	Benzo(b)fluoranthene	3149	ug/kg	3149	ug/kg	M	9.0E-008	mg/kg-day	7.3E-001	mg/kg-day	6.6E-008
	Benzo(a)pyrene	4713	ug/kg	4713	ug/kg	M	1.3E-007	mg/kg-day	7.3E+000	mg/kg-day	9.8E-007
	Methoxychlor	760000	ug/kg	760000	ug/kg	M	1.7E-005	mg/kg-day	--	mg/kg-day	--
	Aroclor-1242	10538	ug/kg	10538	ug/kg	M	3.2E-007	mg/kg-day	2.0E+000	mg/kg-day	6.5E-007
	Aroclor-1248	74000	ug/kg	74000	ug/kg	M	2.3E-006	mg/kg-day	2.0E+000	mg/kg-day	4.6E-006
	Arsenic	828	mg/kg	828	mg/kg	M	5.5E-006	mg/kg-day	1.5E+000	mg/kg-day	8.2E-006
	Thallium	1.8	mg/kg	1.8	mg/kg	M	4.0E-009	mg/kg-day	--	mg/kg-day	--
	(Total)										2.2E-005
Total Risk Across All Exposure Routes/Pathways											4.7E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.7b.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Benzo(a)pyrene	93	ug/kg	93	ug/kg	M	1.6E-009	mg/kg-day	7.3E+000	mg/kg-day	1.2E-008
	Aroclor-1254	164	ug/kg	164	ug/kg	M	2.8E-009	mg/kg-day	2.0E+000	mg/kg-day	5.6E-009
	Aroclor-1260	176	ug/kg	176	ug/kg	M	3.0E-009	mg/kg-day	2.0E+000	mg/kg-day	6.0E-009
	Methoxychlor	18000	ug/kg	18000	ug/kg	M	3.1E-007	mg/kg-day	-	mg/kg-day	-
	Aluminum	9082	mg/kg	9082	mg/kg	M	1.5E-004	mg/kg-day	-	mg/kg-day	-
	Antimony	0.83	mg/kg	0.83	mg/kg	M	1.4E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	29	mg/kg	29	mg/kg	M	4.9E-007	mg/kg-day	1.5E+000	mg/kg-day	7.4E-007
	Cadmium	0.67	mg/kg	0.67	mg/kg	M	1.1E-008	mg/kg-day	-	mg/kg-day	-
	Manganese	197	mg/kg	197	mg/kg	M	3.3E-008	mg/kg-day	-	mg/kg-day	-
	Thallium	1.2	mg/kg	1.2	mg/kg	M	2.0E-008	mg/kg-day	-	mg/kg-day	-
	Vanadium	33	mg/kg	33	mg/kg	M	5.6E-007	mg/kg-day	-	mg/kg-day	-
	(Total)										7.6E-007
Dermal	Benzo(a)pyrene	93	ug/kg	93	ug/kg	M	2.7E-009	mg/kg-day	7.3E+000	mg/kg-day	1.9E-008
	Aroclor-1254	164	ug/kg	164	ug/kg	M	5.1E-009	mg/kg-day	2.0E+000	mg/kg-day	1.0E-008
	Aroclor-1260	176	ug/kg	176	ug/kg	M	5.4E-009	mg/kg-day	2.0E+000	mg/kg-day	1.1E-008
	Methoxychlor	18000	ug/kg	18000	ug/kg	M	4.0E-007	mg/kg-day	-	mg/kg-day	-
	Aluminum	9082	mg/kg	9082	mg/kg	M	2.0E-005	mg/kg-day	-	mg/kg-day	-
	Antimony	0.83	mg/kg	0.83	mg/kg	M	1.8E-009	mg/kg-day	-	mg/kg-day	-
	Arsenic	29	mg/kg	29	mg/kg	M	1.9E-007	mg/kg-day	1.5E+000	mg/kg-day	2.9E-007
	Cadmium	0.67	mg/kg	0.67	mg/kg	M	1.5E-010	mg/kg-day	-	mg/kg-day	-
	Manganese	197	mg/kg	197	mg/kg	M	4.3E-007	mg/kg-day	-	mg/kg-day	-
	Thallium	1.2	mg/kg	1.2	mg/kg	M	2.8E-009	mg/kg-day	-	mg/kg-day	-
	Vanadium	33	mg/kg	33	mg/kg	M	7.3E-008	mg/kg-day	-	mg/kg-day	-
	(Total)										3.3E-007
Total Risk Across All Exposure Routes/Pathways											1.1E-006

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.7b.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Test Pit Soil  
Exposure Point: AOC 3 - SPD  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Hexachloroethane	10,201,148	ug/kg	10,201,148	ug/kg	M	1.7E-004	mg/kg-day	1.4E-002	mg/kg-day	2.4E-008
	Benzo(a)pyrene	4700	ug/kg	4700	ug/kg	M	8.0E-008	mg/kg-day	7.3E+000	mg/kg-day	5.8E-007
	Dibenzo(a,h)anthracene	920	ug/kg	920	ug/kg	M	1.6E-008	mg/kg-day	7.3E+000	mg/kg-day	1.1E-007
	Aroclor-1248	21000	ug/kg	21000	ug/kg	M	3.6E-007	mg/kg-day	2.0E+000	mg/kg-day	7.1E-007
	Aroclor-1254	6000	ug/kg	6000	ug/kg	M	1.0E-007	mg/kg-day	2.0E+000	mg/kg-day	2.0E-007
	Arsenic	77	mg/kg	77	mg/kg	M	1.3E-008	mg/kg-day	1.5E+000	mg/kg-day	2.0E-008
	Copper	32300	mg/kg	32300	mg/kg	M	5.5E-004	mg/kg-day	--	mg/kg-day	--
	(Total)										6.0E-008
Dermal	Hexachloroethane	10,201,148	ug/kg	10,201,148	ug/kg	M	2.2E-004	mg/kg-day	1.4E-002	mg/kg-day	3.1E-008
	Benzo(a)pyrene	4700	ug/kg	4700	ug/kg	M	1.3E-007	mg/kg-day	7.3E+000	mg/kg-day	9.8E-007
	Dibenzo(a,h)anthracene	920	ug/kg	920	ug/kg	M	2.6E-008	mg/kg-day	7.3E+000	mg/kg-day	1.9E-007
	Aroclor-1248	21000	ug/kg	21000	ug/kg	M	6.5E-007	mg/kg-day	2.0E+000	mg/kg-day	1.3E-008
	Aroclor-1254	6000	ug/kg	6000	ug/kg	M	1.8E-007	mg/kg-day	2.0E+000	mg/kg-day	3.7E-007
	Arsenic	77	mg/kg	77	mg/kg	M	5.1E-007	mg/kg-day	1.5E+000	mg/kg-day	7.6E-007
	Copper	32300	mg/kg	32300	mg/kg	M	7.1E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										6.7E-008
Total Risk Across All Exposure Routes/Pathways											1.3E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400354

TABLE 8.7b.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Soil  
Exposure Medium: Subsurface Soil  
Exposure Point: AOC 4 - ARC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion	Tetrachloroethene	19252	ug/kg	19252	ug/kg	M	3.3E-007	mg/kg-day	5.2E-002	mg/kg-day	1.7E-008
	Chlorobenzene	29736	ug/kg	29736	ug/kg	M	5.1E-007	mg/kg-day	--	mg/kg-day	--
	Benzo(a)anthracene	793	ug/kg	793	ug/kg	M	1.3E-008	mg/kg-day	7.3E-001	mg/kg-day	9.8E-009
	Benzo(b)fluoranthene	830	ug/kg	830	ug/kg	M	1.4E-008	mg/kg-day	7.3E-001	mg/kg-day	1.0E-008
	Benzo(a)pyrene	767	ug/kg	767	ug/kg	M	1.3E-008	mg/kg-day	7.3E+000	mg/kg-day	9.5E-008
	Indeno(1,2,3-cd)pyrene	693	ug/kg	693	ug/kg	M	1.2E-008	mg/kg-day	7.3E-001	mg/kg-day	8.6E-009
	1,2,4-Trichlorobenzene	112687	ug/kg	112687	ug/kg	M	1.9E-006	mg/kg-day	--	mg/kg-day	--
	Aldrin	5.7	ug/kg	5.7	ug/kg	M	9.7E-011	mg/kg-day	1.7E+001	mg/kg-day	1.6E-009
	Aroclor-1248	149	ug/kg	149	ug/kg	M	2.5E-009	mg/kg-day	2.0E+000	mg/kg-day	5.1E-009
	Aroclor-1254	56	ug/kg	56	ug/kg	M	9.5E-010	mg/kg-day	2.0E+000	mg/kg-day	1.9E-009
	Aluminum	13018	mg/kg	13018	mg/kg	M	2.2E-004	mg/kg-day	--	mg/kg-day	--
	Antimony	2.1	mg/kg	2.1	mg/kg	M	3.6E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	13	mg/kg	13	mg/kg	M	2.2E-007	mg/kg-day	1.5E+000	mg/kg-day	3.3E-007
	Manganese	133	mg/kg	133	mg/kg	M	2.3E-008	mg/kg-day	--	mg/kg-day	--
	Thallium	1.1	mg/kg	1.1	mg/kg	M	1.9E-008	mg/kg-day	--	mg/kg-day	--
	Vanadium	43	mg/kg	43	mg/kg	M	7.3E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										4.8E-007
Dermal	Tetrachloroethene	19252	ug/kg	19252	ug/kg	M	4.2E-008	mg/kg-day	5.2E-002	mg/kg-day	2.2E-007
	Chlorobenzene	29736	ug/kg	29736	ug/kg	M	6.5E-008	mg/kg-day	--	mg/kg-day	--
	Benzo(a)anthracene	793	ug/kg	793	ug/kg	M	2.3E-008	mg/kg-day	7.30E-001	mg/kg-day	1.7E-008
	Benzo(b)fluoranthene	830	ug/kg	830	ug/kg	M	2.4E-008	mg/kg-day	7.3E-001	mg/kg-day	1.7E-008
	Benzo(a)pyrene	767	ug/kg	767	ug/kg	M	2.2E-008	mg/kg-day	7.3E+000	mg/kg-day	1.6E-007
	Indeno(1,2,3-cd)pyrene	693	ug/kg	693	ug/kg	M	2.0E-008	mg/kg-day	7.3E-001	mg/kg-day	1.4E-008
	1,2,4-Trichlorobenzene	112687	ug/kg	112687	ug/kg	M	2.5E-008	mg/kg-day	--	mg/kg-day	--
	Aldrin	5.7	ug/kg	5.7	ug/kg	M	1.3E-010	mg/kg-day	1.7E+001	mg/kg-day	2.1E-009
	Aroclor-1248	149	ug/kg	149	ug/kg	M	4.8E-009	mg/kg-day	2.0E+000	mg/kg-day	9.2E-009
	Aroclor-1254	56	ug/kg	56	ug/kg	M	1.7E-009	mg/kg-day	2.0E+000	mg/kg-day	3.4E-009
	Aluminum	13018	mg/kg	13018	mg/kg	M	2.9E-005	mg/kg-day	--	mg/kg-day	--
	Antimony	2.1	mg/kg	2.1	mg/kg	M	4.6E-009	mg/kg-day	--	mg/kg-day	--
	Arsenic	13	mg/kg	13	mg/kg	M	8.6E-008	mg/kg-day	1.5E+000	mg/kg-day	1.3E-007
	Manganese	133	mg/kg	133	mg/kg	M	2.9E-007	mg/kg-day	--	mg/kg-day	--
	Thallium	1.1	mg/kg	1.1	mg/kg	M	2.4E-009	mg/kg-day	--	mg/kg-day	--
	Vanadium	43	mg/kg	43	mg/kg	M	9.5E-008	mg/kg-day	--	mg/kg-day	--
	(Total)										5.7E-007
Total Risk Across All Exposure Routes/Pathways											1.1E-006

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400355

TABLE 8.8 RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	2.0E-004	mg/kg-day	7.3E-001	mg/kg-day	1.4E-004
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	2.5E-004	mg/kg-day	7.3E-001	mg/kg-day	1.8E-004
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	2.0E-004	mg/kg-day	7.3E+000	mg/kg-day	1.4E-003
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	5.4E-005	mg/kg-day	7.3E-001	mg/kg-day	3.9E-005
	Dibenzo(a,h)anthracene	90000	ug/kg	90000	ug/kg	M	1.6E-005	mg/kg-day	7.3E+000	mg/kg-day	1.2E-004
	Naphthalene	320000	ug/kg	320000	ug/kg	M	5.8E-005	mg/kg-day	--	mg/kg-day	--
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	2.0E-004	mg/kg-day	--	mg/kg-day	--
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	1.4E-004	mg/kg-day	--	mg/kg-day	--
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	1.8E-004	mg/kg-day	--	mg/kg-day	--
	Fluorene	1600000	ug/kg	1600000	ug/kg	M	2.9E-004	mg/kg-day	--	mg/kg-day	--
	Fluoranthene	3900000	ug/kg	3900000	ug/kg	M	7.0E-004	mg/kg-day	--	mg/kg-day	--
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	5.0E-004	mg/kg-day	--	mg/kg-day	--
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	2.7E-005	mg/kg-day	--	mg/kg-day	--
	Antimony	5.7	mg/kg	5.7	mg/kg	M	1.0E-006	mg/kg-day	--	mg/kg-day	--
	Arsenic	84	mg/kg	84	mg/kg	M	1.5E-005	mg/kg-day	1.5E+000	mg/kg-day	2.3E-005
	Copper	495	mg/kg	495	mg/kg	M	8.9E-005	mg/kg-day	--	mg/kg-day	--
	Manganese	495	mg/kg	495	mg/kg	M	8.9E-005	mg/kg-day	--	mg/kg-day	--
	Thallium	1.8	mg/kg	1.8	mg/kg	M	3.2E-007	mg/kg-day	--	mg/kg-day	--
	Zinc	3050	mg/kg	3050	mg/kg	M	5.5E-004	mg/kg-day	--	mg/kg-day	--
	(Total)										2.0E-003
Dermal	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	2.9E-003	mg/kg-day	7.3E-001	mg/kg-day	2.1E-003
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	3.6E-003	mg/kg-day	7.3E-001	mg/kg-day	2.7E-003
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	2.9E-003	mg/kg-day	7.3E+000	mg/kg-day	2.1E-002
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	7.8E-004	mg/kg-day	7.3E-001	mg/kg-day	5.7E-004
	Dibenzo(a,h)anthracene	90000	ug/kg	90000	ug/kg	M	2.3E-004	mg/kg-day	7.3E+000	mg/kg-day	1.7E-003
	Naphthalene	320000	ug/kg	320000	ug/kg	M	8.3E-004	mg/kg-day	--	mg/kg-day	--
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	2.9E-003	mg/kg-day	--	mg/kg-day	--
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	2.1E-003	mg/kg-day	--	mg/kg-day	--
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	2.6E-003	mg/kg-day	--	mg/kg-day	--
	Fluorene	1600000	ug/kg	1600000	ug/kg	M	4.2E-003	mg/kg-day	--	mg/kg-day	--
	Fluoranthene	3900000	ug/kg	3900000	ug/kg	M	1.0E-002	mg/kg-day	--	mg/kg-day	--
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	7.3E-003	mg/kg-day	--	mg/kg-day	--
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	3.0E-004	mg/kg-day	--	mg/kg-day	--
	Antimony	5.7	mg/kg	5.7	mg/kg	M	1.1E-006	mg/kg-day	--	mg/kg-day	--
	Arsenic	84	mg/kg	84	mg/kg	M	5.0E-005	mg/kg-day	1.5E+000	mg/kg-day	7.6E-005
	Copper	495	mg/kg	495	mg/kg	M	9.9E-005	mg/kg-day	--	mg/kg-day	--
	Manganese	495	mg/kg	495	mg/kg	M	9.9E-005	mg/kg-day	--	mg/kg-day	--
	Thallium	1.8	mg/kg	1.8	mg/kg	M	3.6E-007	mg/kg-day	--	mg/kg-day	--
	Zinc	3050	mg/kg	3050	mg/kg	M	6.1E-004	mg/kg-day	--	mg/kg-day	--
	(Total)										2.8E-002
											3.0E-002

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

TABLE 8.8.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	468143	ug/kg	468143	ug/kg	M	1.1E-005	mg/kg-day	7.3E-001	mg/kg-day	7.8E-006
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	1.2E-005	mg/kg-day	7.3E-001	mg/kg-day	9.1E-006
	Benzo(a)pyrene	426620	ug/kg	426620	ug/kg	M	9.8E-006	mg/kg-day	7.3E+000	mg/kg-day	7.2E-005
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	3.4E-006	mg/kg-day	7.3E-001	mg/kg-day	2.5E-006
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	9.8E-007	mg/kg-day	7.3E+000	mg/kg-day	7.1E-006
	Naphthalene	100988	ug/kg	100988	ug/kg	M	2.3E-006	mg/kg-day	—	mg/kg-day	—
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	1.1E-005	mg/kg-day	—	mg/kg-day	—
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	8.2E-006	mg/kg-day	—	mg/kg-day	—
	Dibenzofuran	398113	ug/kg	398113	ug/kg	M	9.2E-006	mg/kg-day	—	mg/kg-day	—
	Fluorene	583363	ug/kg	583363	ug/kg	M	1.3E-005	mg/kg-day	—	mg/kg-day	—
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	4.2E-005	mg/kg-day	—	mg/kg-day	—
	Pyrene	1411478	ug/kg	1411478	ug/kg	M	3.2E-005	mg/kg-day	—	mg/kg-day	—
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	8.7E-007	mg/kg-day	—	mg/kg-day	—
	Antimony	3.7	mg/kg	3.7	mg/kg	M	8.5E-008	mg/kg-day	—	mg/kg-day	—
	Arsenic	46	mg/kg	46	mg/kg	M	1.1E-006	mg/kg-day	1.5E+000	mg/kg-day	1.6E-006
	Copper	253	mg/kg	253	mg/kg	M	5.8E-006	mg/kg-day	—	mg/kg-day	—
	Manganese	239	mg/kg	239	mg/kg	M	5.5E-006	mg/kg-day	—	mg/kg-day	—
	Thallium	0.9	mg/kg	0.9	mg/kg	M	2.1E-008	mg/kg-day	—	mg/kg-day	—
	Zinc	981	mg/kg	981	mg/kg	M	2.3E-005	mg/kg-day	—	mg/kg-day	—
	(Total)										1.0E-004
Dermal	Benzo(a)anthracene	468143	ug/kg	468143	ug/kg	M	2.9E-004	mg/kg-day	7.3E-001	mg/kg-day	2.1E-004
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	3.3E-004	mg/kg-day	7.3E-001	mg/kg-day	2.4E-004
	Benzo(a)pyrene	426620	ug/kg	426620	ug/kg	M	2.6E-004	mg/kg-day	7.3E+000	mg/kg-day	1.9E-003
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	9.0E-005	mg/kg-day	7.3E-001	mg/kg-day	6.6E-005
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	2.6E-005	mg/kg-day	7.3E+000	mg/kg-day	1.9E-004
	Naphthalene	100988	ug/kg	100988	ug/kg	M	6.2E-005	mg/kg-day	—	mg/kg-day	—
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	3.0E-004	mg/kg-day	—	mg/kg-day	—
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	2.2E-004	mg/kg-day	—	mg/kg-day	—
	Dibenzofuran	398113	ug/kg	398113	ug/kg	M	2.4E-004	mg/kg-day	—	mg/kg-day	—
	Fluorene	583363	ug/kg	583363	ug/kg	M	3.6E-004	mg/kg-day	—	mg/kg-day	—
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	1.1E-003	mg/kg-day	—	mg/kg-day	—
	Pyrene	1411478	ug/kg	1411478	ug/kg	M	8.8E-004	mg/kg-day	—	mg/kg-day	—
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	1.8E-005	mg/kg-day	—	mg/kg-day	—
	Antimony	3.7	mg/kg	3.7	mg/kg	M	1.7E-007	mg/kg-day	—	mg/kg-day	—
	Arsenic	46	mg/kg	46	mg/kg	M	6.5E-008	mg/kg-day	1.5E+000	mg/kg-day	9.7E-006
	Copper	253	mg/kg	253	mg/kg	M	1.2E-005	mg/kg-day	—	mg/kg-day	—
	Manganese	239	mg/kg	239	mg/kg	M	1.1E-005	mg/kg-day	—	mg/kg-day	—
	Thallium	0.9	mg/kg	0.9	mg/kg	M	4.2E-008	mg/kg-day	—	mg/kg-day	—
	Zinc	981	mg/kg	981	mg/kg	M	4.6E-005	mg/kg-day	—	mg/kg-day	—
	(Total)										2.6E-003
											2.7E-003

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

— Cancer Slope Factor not available, therefore Cancer Risk not calculated.



TABLE 8.8.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 4 - ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	5.4E-008	mg/kg-day	2.0E+000	mg/kg-day	1.1E-005
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	3.1E-008	mg/kg-day	1.5E+005	mg/kg-day	4.8E-004
	Antimony	31700	mg/kg	31700	mg/kg	M	5.7E-003	mg/kg-day	—	mg/kg-day	—
	Arsenic	254	mg/kg	254	mg/kg	M	4.8E-005	mg/kg-day	1.5E+000	mg/kg-day	6.9E-005
	(Total)										6.4E-004
Dermal	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	8.4E-005	mg/kg-day	2.0E+000	mg/kg-day	1.7E-004
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	1.0E-008	mg/kg-day	1.5E+005	mg/kg-day	1.5E-003
	Antimony	31700	mg/kg	31700	mg/kg	M	6.3E-003	mg/kg-day	—	mg/kg-day	—
	Arsenic	254	mg/kg	254	mg/kg	M	1.5E-004	mg/kg-day	1.5E+000	mg/kg-day	2.3E-004
	(Total)										1.9E-003
											2.5E-003

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

— - Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.8.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 4 - ARC  
Receptor Population: Site Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Aroclor-1254	5599	ug/kg	5599	ug/kg	M	1.3E-007	mg/kg-day	2.0E+000	mg/kg-day	2.6E-007
	2,3,7,8-TCDD equiv.	3.2	ug/kg	3.2	ug/kg	M	7.4E-011	mg/kg-day	1.5E+005	mg/kg-day	1.1E-005
	Antimony	9017	mg/kg	9017	mg/kg	M	2.1E-004	mg/kg-day	--	mg/kg-day	--
	Arsenic	155	mg/kg	155	mg/kg	M	3.6E-006	mg/kg-day	1.5E+000	mg/kg-day	5.3E-006
	(Total)										1.7E-005
Dermal	Aroclor-1254	5599	ug/kg	5599	ug/kg	M	3.7E-006	mg/kg-day	2.0E+000	mg/kg-day	7.4E-006
	2,3,7,8-TCDD equiv.	3.2	ug/kg	3.2	ug/kg	M	4.6E-010	mg/kg-day	1.5E+005	mg/kg-day	6.8E-005
	Antimony	9017	mg/kg	9017	mg/kg	M	4.2E-004	mg/kg-day	--	mg/kg-day	--
	Arsenic	155	mg/kg	155	mg/kg	M	2.2E-005	mg/kg-day	1.5E+000	mg/kg-day	3.3E-005
	(Total)										1.1E-004
											1.2E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.9.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	1.9E-005	mg/kg-day	7.3E-001	mg/kg-day	1.4E-005
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	2.4E-005	mg/kg-day	7.3E-001	mg/kg-day	1.7E-005
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	1.9E-005	mg/kg-day	7.3E+000	mg/kg-day	1.4E-004
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	5.1E-006	mg/kg-day	7.3E-001	mg/kg-day	3.7E-006
	Dibenzo(a,h)anthracene	90000	ug/kg	90000	ug/kg	M	1.5E-006	mg/kg-day	7.3E+000	mg/kg-day	1.1E-006
	Naphthalene	320000	ug/kg	320000	ug/kg	M	5.4E-006	mg/kg-day	--	mg/kg-day	--
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	1.9E-005	mg/kg-day	--	mg/kg-day	--
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	1.4E-005	mg/kg-day	--	mg/kg-day	--
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	1.7E-005	mg/kg-day	--	mg/kg-day	--
	Fluorene	1600000	ug/kg	1600000	ug/kg	M	2.7E-005	mg/kg-day	--	mg/kg-day	--
	Fluoranthene	3900000	ug/kg	3900000	ug/kg	M	6.6E-005	mg/kg-day	--	mg/kg-day	--
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	4.8E-005	mg/kg-day	--	mg/kg-day	--
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	2.6E-006	mg/kg-day	--	mg/kg-day	--
	Antimony	5.7	mg/kg	5.7	mg/kg	M	9.7E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	84	mg/kg	84	mg/kg	M	1.4E-006	mg/kg-day	1.5E+000	mg/kg-day	2.1E-006
	Copper	495	mg/kg	495	mg/kg	M	8.4E-006	mg/kg-day	--	mg/kg-day	--
	Manganese	495	mg/kg	495	mg/kg	M	8.4E-006	mg/kg-day	--	mg/kg-day	--
	Thallium	1.8	mg/kg	1.8	mg/kg	M	3.1E-008	mg/kg-day	--	mg/kg-day	--
	Zinc	3050	mg/kg	3050	mg/kg	M	5.2E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										1.8E-004
Dermal	Benzo(a)anthracene	1100000	ug/kg	1100000	ug/kg	M	3.1E-005	mg/kg-day	7.3E-001	mg/kg-day	2.3E-005
	Benzo(b)fluoranthene	1400000	ug/kg	1400000	ug/kg	M	4.0E-005	mg/kg-day	7.3E-001	mg/kg-day	2.9E-005
	Benzo(a)pyrene	1100000	ug/kg	1100000	ug/kg	M	3.1E-005	mg/kg-day	7.3E+000	mg/kg-day	2.3E-004
	Indeno(1,2,3-cd)pyrene	300000	ug/kg	300000	ug/kg	M	8.6E-006	mg/kg-day	7.3E-001	mg/kg-day	6.3E-006
	Dibenzo(a,h)anthracene	90000	ug/kg	90000	ug/kg	M	2.6E-006	mg/kg-day	7.3E+000	mg/kg-day	1.9E-005
	Naphthalene	320000	ug/kg	320000	ug/kg	M	9.2E-006	mg/kg-day	--	mg/kg-day	--
	2-Methylnaphthalene	1100000	ug/kg	1100000	ug/kg	M	3.1E-005	mg/kg-day	--	mg/kg-day	--
	Acenaphthene	800000	ug/kg	800000	ug/kg	M	2.3E-005	mg/kg-day	--	mg/kg-day	--
	Dibenzofuran	1000000	ug/kg	1000000	ug/kg	M	2.9E-005	mg/kg-day	--	mg/kg-day	--
	Fluorene	1600000	ug/kg	1600000	ug/kg	M	4.6E-005	mg/kg-day	--	mg/kg-day	--
	Fluoranthene	3900000	ug/kg	3900000	ug/kg	M	1.1E-004	mg/kg-day	--	mg/kg-day	--
	Pyrene	2800000	ug/kg	2800000	ug/kg	M	8.0E-005	mg/kg-day	--	mg/kg-day	--
	Methoxychlor	150000	ug/kg	150000	ug/kg	M	3.3E-006	mg/kg-day	--	mg/kg-day	--
	Antimony	5.7	mg/kg	5.7	mg/kg	M	1.3E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	84	mg/kg	84	mg/kg	M	5.5E-007	mg/kg-day	1.5E+000	mg/kg-day	8.3E-007
	Copper	495	mg/kg	495	mg/kg	M	1.1E-006	mg/kg-day	--	mg/kg-day	--
	Manganese	495	mg/kg	495	mg/kg	M	1.1E-006	mg/kg-day	--	mg/kg-day	--
	Thallium	1.8	mg/kg	1.8	mg/kg	M	4.0E-009	mg/kg-day	--	mg/kg-day	--
	Zinc	3050	mg/kg	3050	mg/kg	M	6.7E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										3.1E-004
											4.9E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

TABLE 8.9.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 2 - ADC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	468143	ug/kg	468143	ug/kg	M	8.0E-006	mg/kg-day	7.3E-001	mg/kg-day	5.8E-006
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	9.2E-006	mg/kg-day	7.3E-001	mg/kg-day	6.7E-006
	Benzo(a)pyrene	426620	ug/kg	426620	ug/kg	M	7.3E-006	mg/kg-day	7.3E+000	mg/kg-day	5.3E-005
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	2.5E-006	mg/kg-day	7.3E-001	mg/kg-day	1.8E-006
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	7.2E-007	mg/kg-day	7.3E+000	mg/kg-day	5.3E-006
	Naphthalene	100988	ug/kg	100988	ug/kg	M	1.7E-006	mg/kg-day	-	mg/kg-day	-
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	8.5E-006	mg/kg-day	-	mg/kg-day	-
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	6.1E-006	mg/kg-day	-	mg/kg-day	-
	Dibenzofuran	398113	ug/kg	398113	ug/kg	M	6.8E-006	mg/kg-day	-	mg/kg-day	-
	Fluorene	583363	ug/kg	583363	ug/kg	M	9.9E-006	mg/kg-day	-	mg/kg-day	-
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	3.1E-005	mg/kg-day	-	mg/kg-day	-
	Pyrene	1411478	ug/kg	1411478	ug/kg	M	2.4E-005	mg/kg-day	-	mg/kg-day	-
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	6.4E-007	mg/kg-day	-	mg/kg-day	-
	Antimony	3.7	mg/kg	3.7	mg/kg	M	6.3E-008	mg/kg-day	-	mg/kg-day	-
	Arsenic	46	mg/kg	46	mg/kg	M	7.8E-007	mg/kg-day	1.5E+000	mg/kg-day	1.2E-006
	Copper	253	mg/kg	253	mg/kg	M	4.3E-008	mg/kg-day	-	mg/kg-day	-
	Manganese	239	mg/kg	239	mg/kg	M	4.1E-006	mg/kg-day	-	mg/kg-day	-
	Thallium	0.9	mg/kg	0.9	mg/kg	M	1.5E-008	mg/kg-day	-	mg/kg-day	-
	Zinc	981	mg/kg	981	mg/kg	M	1.7E-005	mg/kg-day	-	mg/kg-day	-
	(Total)										7.4E-005
Dermal	Benzo(a)anthracene	468143	ug/kg	468143	ug/kg	M	1.3E-005	mg/kg-day	7.3E-001	mg/kg-day	9.8E-006
	Benzo(b)fluoranthene	540875	ug/kg	540875	ug/kg	M	1.5E-005	mg/kg-day	7.3E-001	mg/kg-day	1.1E-005
	Benzo(a)pyrene	426620	ug/kg	426620	ug/kg	M	1.2E-005	mg/kg-day	7.3E+000	mg/kg-day	8.9E-005
	Indeno(1,2,3-cd)pyrene	147910	ug/kg	147910	ug/kg	M	4.2E-006	mg/kg-day	7.3E-001	mg/kg-day	3.1E-006
	Dibenzo(a,h)anthracene	42438	ug/kg	42438	ug/kg	M	1.2E-006	mg/kg-day	7.3E+000	mg/kg-day	8.9E-006
	Naphthalene	100988	ug/kg	100988	ug/kg	M	2.9E-006	mg/kg-day	-	mg/kg-day	-
	2-Methylnaphthalene	498113	ug/kg	498113	ug/kg	M	1.4E-005	mg/kg-day	-	mg/kg-day	-
	Acenaphthene	355888	ug/kg	355888	ug/kg	M	1.0E-005	mg/kg-day	-	mg/kg-day	-
	Dibenzofuran	398113	ug/kg	398113	ug/kg	M	1.1E-005	mg/kg-day	-	mg/kg-day	-
	Fluorene	583363	ug/kg	583363	ug/kg	M	1.7E-005	mg/kg-day	-	mg/kg-day	-
	Fluoranthene	1833525	ug/kg	1833525	ug/kg	M	5.2E-005	mg/kg-day	-	mg/kg-day	-
	Pyrene	1411478	ug/kg	1411478	ug/kg	M	4.0E-005	mg/kg-day	-	mg/kg-day	-
	Methoxychlor	37714	ug/kg	37714	ug/kg	M	8.3E-007	mg/kg-day	-	mg/kg-day	-
	Antimony	3.7	mg/kg	3.7	mg/kg	M	8.1E-009	mg/kg-day	-	mg/kg-day	-
	Arsenic	46	mg/kg	46	mg/kg	M	3.0E-007	mg/kg-day	1.5E+000	mg/kg-day	4.6E-007
	Copper	253	mg/kg	253	mg/kg	M	5.6E-007	mg/kg-day	-	mg/kg-day	-
	Manganese	239	mg/kg	239	mg/kg	M	5.3E-007	mg/kg-day	-	mg/kg-day	-
	Thallium	0.9	mg/kg	0.9	mg/kg	M	2.0E-009	mg/kg-day	-	mg/kg-day	-
	Zinc	981	mg/kg	981	mg/kg	M	2.2E-008	mg/kg-day	-	mg/kg-day	-
	(Total)										1.2E-004
											2.0E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

400361

TABLE 8.9.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Building Materials  
Exposure Medium: Building Materials  
Exposure Point: AOC 4 - ARC  
Receptor Population: Construction Workers  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	5.1E-007	mg/kg-day	2.0E+000	mg/kg-day	1.0E-008
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	2.9E-010	mg/kg-day	1.5E+005	mg/kg-day	4.3E-005
	Antimony	31700	mg/kg	31700	mg/kg	M	5.4E-004	mg/kg-day	-	mg/kg-day	-
	Arsenic	254	mg/kg	254	mg/kg	M	4.3E-008	mg/kg-day	1.5E+000	mg/kg-day	8.5E-008
	(Total)										5.1E-005
Dermal	Aroclor-1254	30000	ug/kg	30000	ug/kg	M	9.2E-007	mg/kg-day	2.0E+000	mg/kg-day	1.8E-008
	2,3,7,8-TCDD equiv.	17	ug/kg	17	ug/kg	M	1.1E-010	mg/kg-day	1.5E+005	mg/kg-day	1.7E-005
	Antimony	31700	mg/kg	31700	mg/kg	M	7.0E-005	mg/kg-day	-	mg/kg-day	-
	Arsenic	254	mg/kg	254	mg/kg	M	1.7E-008	mg/kg-day	1.5E+000	mg/kg-day	2.5E-008
	(Total)										2.1E-005
											7.2E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

- - Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.10.RME  
 CALCULATION OF CANCER RISKS  
 REASONABLE MAXIMUM EXPOSURE  
 HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
 Medium: Surface Water  
 Exposure Medium: Surface Water  
 Exposure Point: AOC 5 - DSM  
 Receptor Population: Residents  
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	0.569	mg/l	0.569	mg/l	M	2.3E-005	mg/kg-day	1.5E+000	mg/kg-day	3.5E-005
	Manganese	1.19	mg/l	1.19	mg/l	M	4.9E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										3.5E-005
Dermal	Arsenic	0.569	mg/l	0.569	mg/l	M	1.1E-005	mg/kg-day	1.5E+000	mg/kg-day	1.6E-005
	Manganese	1.19	mg/l	1.19	mg/l	M	2.3E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										1.6E-005
TOTAL RISK ACROSS ALL PATHWAYS											5.1E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400363

TABLE 8.10.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Surface Water  
Exposure Medium: Surface Water  
Exposure Point: AOC 6 - RR  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Aluminum	2.31	mg/l	2.31	mg/l	M	9.5E-005	mg/kg-day	--	mg/kg-day	--
	Antimony	0.0057	mg/l	0.0057	mg/l	M	2.3E-007	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.02	mg/l	0.02	mg/l	M	8.2E-007	mg/kg-day	1.5E+000	mg/kg-day	1.2E-006
	Copper	0.249	mg/l	0.249	mg/l	M	1.0E-005	mg/kg-day	--	mg/kg-day	--
	Manganese	0.101	mg/l	0.101	mg/l	M	4.1E-006	mg/kg-day	--	mg/kg-day	--
	Thallium	0.005	mg/l	0.005	mg/l	M	2.1E-007	mg/kg-day	--	mg/kg-day	--
	Vanadium	0.0186	mg/l	0.0186	mg/l	M	7.6E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										1.2E-006
Dermal	Aluminum	2.31	mg/l	2.31	mg/l	M	4.4E-005	mg/kg-day	--	mg/kg-day	--
	Antimony	0.0057	mg/l	0.0057	mg/l	M	1.1E-007	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.02	mg/l	0.02	mg/l	M	3.8E-007	mg/kg-day	1.5E+000	mg/kg-day	5.7E-007
	Copper	0.249	mg/l	0.249	mg/l	M	4.7E-006	mg/kg-day	--	mg/kg-day	--
	Manganese	0.101	mg/l	0.101	mg/l	M	1.9E-006	mg/kg-day	--	mg/kg-day	--
	Thallium	0.005	mg/l	0.005	mg/l	M	9.5E-008	mg/kg-day	--	mg/kg-day	--
	Vanadium	0.0186	mg/l	0.0186	mg/l	M	3.5E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										5.7E-007
TOTAL RISK ACROSS ALL PATHWAYS											1.8E-006

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400364

TABLE 8.11.RME  
 CALCULATION OF CANCER RISKS  
 REASONABLE MAXIMUM EXPOSURE  
 HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
 Medium: Surface Water  
 Exposure Medium: Surface Water  
 Exposure Point: AOC 5 - DSM  
 Receptor Population: Residents  
 Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	0.569	mg/l	0.569	mg/l	M	2.8E-005	mg/kg-day	1.5E+000	mg/kg-day	4.2E-005
	Manganese	1.19	mg/l	1.19	mg/l	M	5.8E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										4.2E-005
Dermal	Arsenic	0.569	mg/l	0.569	mg/l	M	4.4E-006	mg/kg-day	1.5E+000	mg/kg-day	6.7E-006
	Manganese	1.19	mg/l	1.19	mg/l	M	9.3E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										6.7E-006
TOTAL RISK ACROSS ALL PATHWAYS											4.8E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400365



TABLE 8.11.RME  
 CALCULATION OF CANCER RISKS  
 REASONABLE MAXIMUM EXPOSURE  
 HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
 Medium: Surface Water  
 Exposure Medium: Surface Water  
 Exposure Point: AOC 6 - RR  
 Receptor Population: Residents  
 Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Aluminum	2.31	mg/l	2.31	mg/l	M	1.1E-004	mg/kg-day	--	mg/kg-day	--
	Antimony	0.0057	mg/l	0.0057	mg/l	M	2.8E-007	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.02	mg/l	0.02	mg/l	M	9.8E-007	mg/kg-day	1.5E+000	mg/kg-day	1.5E-008
	Copper	0.249	mg/l	0.249	mg/l	M	1.2E-005	mg/kg-day	--	mg/kg-day	--
	Manganese	0.101	mg/l	0.101	mg/l	M	4.9E-006	mg/kg-day	--	mg/kg-day	--
	Thallium	0.005	mg/l	0.005	mg/l	M	2.5E-007	mg/kg-day	--	mg/kg-day	--
	Vanadium	0.0186	mg/l	0.0186	mg/l	M	9.1E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										1.5E-008
Dermal	Aluminum	2.31	mg/l	2.31	mg/l	M	1.8E-005	mg/kg-day	--	mg/kg-day	--
	Antimony	0.0057	mg/l	0.0057	mg/l	M	4.4E-008	mg/kg-day	--	mg/kg-day	--
	Arsenic	0.02	mg/l	0.02	mg/l	M	1.8E-007	mg/kg-day	1.5E+000	mg/kg-day	2.3E-007
	Copper	0.249	mg/l	0.249	mg/l	M	1.9E-006	mg/kg-day	--	mg/kg-day	--
	Manganese	0.101	mg/l	0.101	mg/l	M	7.9E-007	mg/kg-day	--	mg/kg-day	--
	Thallium	0.005	mg/l	0.005	mg/l	M	3.9E-008	mg/kg-day	--	mg/kg-day	--
	Vanadium	0.0186	mg/l	0.0186	mg/l	M	1.5E-007	mg/kg-day	--	mg/kg-day	--
	(Total)										2.3E-007
TOTAL RISK ACROSS ALL PATHWAYS											1.7E-008

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- - Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400366

TABLE 8.12.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 5 - DSM  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	9.8E-008	mg/kg-day	7.3E-001	mg/kg-day	7.0E-009
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	2.3E-008	mg/kg-day	7.3E-001	mg/kg-day	1.7E-008
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	9.8E-009	mg/kg-day	7.3E+000	mg/kg-day	7.0E-008
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	7.0E-009	mg/kg-day	7.3E-001	mg/kg-day	5.1E-009
	Aroclor-1254	470	ug/kg	470	ug/kg	M	1.5E-008	mg/kg-day	2.0E+000	mg/kg-day	3.0E-008
	Arsenic	4030	mg/kg	4030	mg/kg	M	1.3E-004	mg/kg-day	1.5E+000	mg/kg-day	1.8E-004
	(Total)										1.9E-004
Dermal	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	3.2E-008	mg/kg-day	7.3E-001	mg/kg-day	2.3E-008
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	7.7E-008	mg/kg-day	7.3E-001	mg/kg-day	5.6E-008
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	3.2E-008	mg/kg-day	7.3E+000	mg/kg-day	2.3E-007
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	2.3E-008	mg/kg-day	7.3E-001	mg/kg-day	1.7E-008
	Aroclor-1254	470	ug/kg	470	ug/kg	M	5.3E-008	mg/kg-day	2.0E+000	mg/kg-day	1.1E-007
	Arsenic	4030	mg/kg	4030	ug/kg	M	9.8E-005	mg/kg-day	1.5E+000	mg/kg-day	1.5E-004
	(Total)										1.5E-004
Total Risk Across All Exposure Pathways											3.4E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.12.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 5 - DSM  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	3.6E-009	mg/kg-day	7.3E-001	mg/kg-day	2.6E-009
	Benzo(b)fluoranthene	407	ug/kg	407	ug/kg	M	4.9E-009	mg/kg-day	7.3E-001	mg/kg-day	3.6E-009
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	3.6E-009	mg/kg-day	7.3E+000	mg/kg-day	2.6E-008
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	2.6E-009	mg/kg-day	7.3E-001	mg/kg-day	1.9E-009
	Aroclor-1254	387	ug/kg	387	ug/kg	M	4.6E-009	mg/kg-day	2.0E+000	mg/kg-day	9.3E-009
	Arsenic	1917	mg/kg	1917	mg/kg	M	2.3E-005	mg/kg-day	1.5E+000	mg/kg-day	3.5E-005
	(Total)										3.5E-005
Dermal	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	1.2E-008	mg/kg-day	7.3E-001	mg/kg-day	8.8E-009
	Benzo(b)fluoranthene	407	ug/kg	407	ug/kg	M	1.6E-008	mg/kg-day	7.3E-001	mg/kg-day	1.2E-008
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	1.2E-008	mg/kg-day	7.3E+000	mg/kg-day	8.8E-008
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	8.9E-009	mg/kg-day	7.3E-001	mg/kg-day	6.5E-009
	Aroclor-1254	387	ug/kg	387	ug/kg	M	1.7E-008	mg/kg-day	2.0E+000	mg/kg-day	3.4E-008
	Arsenic	1917	mg/kg	1917	ug/kg	M	1.8E-005	mg/kg-day	1.5E+000	mg/kg-day	2.7E-005
	(Total)										2.7E-005
Total Risk Across All Exposure Pathways											6.1E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.12.RME  
 CALCULATION OF CANCER RISKS  
 REASONABLE MAXIMUM EXPOSURE  
 HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
 Medium: Sediment  
 Exposure Medium: Sediment  
 Exposure Point: AOC 6 - RR  
 Receptor Population: Residents  
 Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Arsenic	2200	mg/kg	2200	mg/kg	M	7.0E-005	mg/kg-day	1.5E+000	mg/kg-day	1.1E-004
	Copper	3580	mg/kg	3580	mg/kg	M	1.1E-004	mg/kg-day	--	mg/kg-day	--
	(Total)										1.1E-004
Dermal	Arsenic	2200	mg/kg	2200	mg/kg	M	5.3E-005	mg/kg-day	1.5E+000	mg/kg-day	8.0E-005
	Copper	3580	mg/kg	3580	mg/kg	M	2.8E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										8.0E-005
Total Risk Across All Exposure Pathways											1.9E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400369

TABLE 8.12.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 6 - RR  
Receptor Population: Residents  
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Arsenic	450	mg/kg	450	mg/kg	M	5.4E-006	mg/kg-day	1.5E+000	mg/kg-day	8.1E-006
	Copper	1573	mg/kg	1573	mg/kg	M	1.9E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										8.1E-006
Dermal	Arsenic	450	mg/kg	450	mg/kg	M	4.2E-006	mg/kg-day	1.5E+000	mg/kg-day	6.3E-006
	Copper	1573	mg/kg	1573	mg/kg	M	4.9E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										6.3E-006
Total Risk Across All Exposure Pathways											1.4E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400370

TABLE 8.13.RME  
CALCULATION OF CANCER RISKS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 5 - DSM  
Receptor Population: Residents  
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	2.3E-008	mg/kg-day	7.3E-001	mg/kg-day	1.6E-008
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	5.5E-008	mg/kg-day	7.3E-001	mg/kg-day	4.0E-008
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	2.3E-008	mg/kg-day	7.3E+000	mg/kg-day	1.6E-007
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	1.7E-008	mg/kg-day	7.3E-001	mg/kg-day	1.2E-008
	Aroclor-1254	470	ug/kg	470	ug/kg	M	3.5E-008	mg/kg-day	2.0E+000	mg/kg-day	7.1E-008
	Arsenic	4030	mg/kg	4030	mg/kg	M	3.0E-004	mg/kg-day	1.5E+000	mg/kg-day	4.5E-004
	(Total)										4.5E-004
Dermal	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	2.3E-008	mg/kg-day	7.3E-001	mg/kg-day	1.7E-008
	Benzo(b)fluoranthene	730	ug/kg	730	ug/kg	M	5.7E-008	mg/kg-day	7.3E-001	mg/kg-day	4.2E-008
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	2.3E-008	mg/kg-day	7.3E+000	mg/kg-day	1.7E-007
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	1.7E-008	mg/kg-day	7.3E-001	mg/kg-day	1.3E-008
	Aroclor-1254	470	ug/kg	470	ug/kg	M	3.9E-008	mg/kg-day	2.0E+000	mg/kg-day	7.9E-008
	Arsenic	4030	mg/kg	4030	ug/kg	M	7.3E-005	mg/kg-day	1.5E+000	mg/kg-day	1.1E-004
	(Total)										1.1E-004
											5.6E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400371

TABLE 8.13.CT  
CALCULATION OF CANCER RISKS  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Medium: Sediment  
Exposure Medium: Sediment  
Exposure Point: AOC 5 - DSM  
Receptor Population: Residents  
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	2.3E-008	mg/kg-day	7.3E-001	mg/kg-day	1.6E-008
	Benzo(b)fluoranthene	407	ug/kg	407	ug/kg	M	3.1E-008	mg/kg-day	7.3E-001	mg/kg-day	2.2E-008
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	2.3E-008	mg/kg-day	7.3E+000	mg/kg-day	1.6E-007
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	1.7E-008	mg/kg-day	7.3E-001	mg/kg-day	1.2E-008
	Aroclor-1254	387	ug/kg	387	ug/kg	M	2.8E-008	mg/kg-day	2.0E+000	mg/kg-day	5.8E-008
	Arsenic	1917	mg/kg	1917	mg/kg	M	1.4E-004	mg/kg-day	1.5E+000	mg/kg-day	2.2E-004
	(Total)										2.2E-004
Dermal	Benzo(a)anthracene	300	ug/kg	300	ug/kg	M	2.3E-008	mg/kg-day	7.3E-001	mg/kg-day	1.7E-008
	Benzo(b)fluoranthene	407	ug/kg	407	ug/kg	M	3.2E-008	mg/kg-day	7.3E-001	mg/kg-day	2.3E-008
	Benzo(a)pyrene	300	ug/kg	300	ug/kg	M	2.3E-008	mg/kg-day	7.3E+000	mg/kg-day	1.7E-007
	Indeno(1,2,3-cd)pyrene	220	ug/kg	220	ug/kg	M	1.7E-008	mg/kg-day	7.3E-001	mg/kg-day	1.3E-008
	Aroclor-1254	387	ug/kg	387	ug/kg	M	3.3E-008	mg/kg-day	2.0E+000	mg/kg-day	6.5E-008
	Arsenic	1917	mg/kg	1917	ug/kg	M	3.5E-005	mg/kg-day	1.5E+000	mg/kg-day	5.2E-005
	(Total)										5.2E-005
											2.7E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

TABLE 8.13 RME  
 CALCULATION OF CANCER RISKS  
 REASONABLE MAXIMUM EXPOSURE  
 HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
 Medium: Sediment  
 Exposure Medium: Sediment  
 Exposure Point: AOC 6 - RR  
 Receptor Population: Residents  
 Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Arsenic	2200	mg/kg	2200	mg/kg	M	1.7E-004	mg/kg-day	1.5E+000	mg/kg-day	2.5E-004
	Copper	3560	mg/kg	3560	mg/kg	M	2.7E-004	mg/kg-day	--	mg/kg-day	--
	(Total)										2.5E-004
Dermal	Arsenic	2200	mg/kg	2200	mg/kg	M	4.0E-005	mg/kg-day	1.5E+000	mg/kg-day	5.9E-005
	Copper	3560	mg/kg	3560	mg/kg	M	2.1E-005	mg/kg-day	--	mg/kg-day	--
	(Total)										5.9E-005
Total Risk Across All Exposure Pathways											3.1E-004

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- - Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400373



TABLE 8.13.CT  
 CALCULATION OF CANCER RISKS  
 CENTRAL TENDENCY EXPOSURE  
 HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
 Medium: Sediment  
 Exposure Medium: Sediment  
 Exposure Point: AOC 6 - RR  
 Receptor Population: Residents  
 Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Dose Units	Cancer Risk
Ingestion	Arsenic	450	mg/kg	450	mg/kg	M	3.4E-005	mg/kg-day	1.5E+000	mg/kg-day	5.1E-005
	Copper	1573	mg/kg	1573	mg/kg	M	1.2E-004	mg/kg-day	--	mg/kg-day	--
	(Total)										5.1E-005
Dermal	Arsenic	450	mg/kg	450	mg/kg	M	8.1E-006	mg/kg-day	1.5E+000	mg/kg-day	1.2E-005
	Copper	1573	mg/kg	1573	mg/kg	M	9.4E-006	mg/kg-day	--	mg/kg-day	--
	(Total)										1.2E-005
Total Risk Across All Exposure Pathways											6.3E-005

(1) Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

-- Cancer Slope Factor not available, therefore Cancer Risk not calculated.

N/A - Not Applicable.

400374

TABLE 9.1.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 1 - HRDD	Dieldrin	9.8E-008	-	2.5E-008	3.6E-008	Dieldrin		1.4E-004	-	3.8E-004	6.0E-004
			Aroclor-1248	9.7E-008	-	3.6E-007	4.6E-007	Aroclor-1248		-	-	-	-
			Aroclor-1254	8.7E-008	-	3.1E-008	4.0E-008	Aroclor-1254		2.8E-003	-	8.9E-003	1.2E-002
			Aroclor-1260	7.3E-008	-	2.8E-008	3.3E-008	Aroclor-1260		-	-	-	-
			Aluminum	-	-	-	-	Aluminum		8.8E-004	-	2.1E-004	1.1E-003
			Antimony	-	-	-	-	Antimony		5.1E-004	-	1.3E-004	8.4E-004
			Arsenic	4.1E-007	-	3.1E-007	7.2E-007	Arsenic		1.1E-002	-	8.0E-003	1.9E-002
			Cadmium	-	-	-	-	Cadmium		2.7E-004	-	8.8E-006	2.8E-004
			Copper	-	-	-	-	Copper		9.8E-004	-	1.8E-004	9.1E-004
			Manganese	-	-	-	-	Manganese		1.1E-003	-	2.8E-004	1.4E-003
			Nickel	-	-	-	-	Nickel		3.2E-004	-	8.1E-006	4.0E-004
			Silver	-	-	-	-	Silver		3.8E-004	-	9.0E-006	4.8E-004
			Thallium	-	-	-	-	Thallium		9.8E-004	-	2.1E-004	1.1E-003
			Vanadium	-	-	-	-	Vanadium		5.6E-004	-	1.4E-004	8.9E-004
				(Total)	6.3E-007	-	7.4E-007	1.3E-008	(Total)		1.9E-002	-	1.9E-002
Surface Water	Surface Water	AOC 1 - HRDD	Vinyl Chloride	2.0E-008	-	2.8E-008	2.3E-008	Vinyl Chloride		-	-	-	-
			Antimony	-	-	-	-	Antimony		7.6E-004	-	1.4E-006	7.6E-004
			Arsenic	3.6E-007	-	6.3E-008	3.8E-007	Arsenic		9.0E-003	-	1.8E-004	9.2E-003
			Cadmium	-	-	-	-	Cadmium		5.1E-004	-	9.4E-006	6.2E-004
			Copper	-	-	-	-	Copper		9.2E-004	-	1.7E-006	9.4E-004
			Manganese	-	-	-	-	Manganese		1.3E-003	-	2.4E-006	1.3E-003
			Nickel	-	-	-	-	Nickel		8.2E-002	-	1.1E-004	8.2E-002
	(Total)	3.7E-007	-	8.9E-008	3.8E-007	(Total)		7.4E-002	-	3.4E-004	7.4E-002		
Sediment	Sediment	AOC 1 - HRDD	Antimony	-	-	-	-	Antimony		8.4E-003	-	5.9E-004	7.0E-003
			Arsenic	1.7E-006	-	4.7E-006	2.2E-006	Arsenic		4.4E-001	-	1.2E-001	6.8E-001
			Copper	-	-	-	-	Copper		1.8E-002	-	1.8E-003	1.8E-002
			Manganese	-	-	-	-	Manganese		1.0E-002	-	9.5E-004	1.1E-002
			Thallium	-	-	-	-	Thallium		5.7E-003	-	6.2E-004	6.2E-003
			(Total)	1.7E-006	-	4.7E-006	2.1E-006	(Total)		4.8E-001	-	1.2E-001	6.0E-001
Total Risk Across All Media				2.3E-005				Total Hazard Index Across All Media and All Exposure Routes					7.1E-001
Total Risk Across All Media and All Exposure Routes													

TABLE 9.1.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 2 - ADC	Benzo(a)anthracene	7.8E-008	—	2.6E-007	3.4E-007	Benzo(a)anthracene	—	—	—	—	—
			Benzo(b)fluoranthene	1.1E-007	—	3.7E-007	4.8E-007	Benzo(b)fluoranthene	—	—	—	—	—
			Benzo(a)pyrene	7.4E-007	—	2.5E-006	3.2E-006	Benzo(a)pyrene	—	—	—	—	—
			Indeno(1,2,3-cd)pyrene	4.5E-008	—	1.5E-007	2.0E-007	Indeno(1,2,3-cd)pyrene	—	—	—	—	—
			Dibenzo(a,h)anthracene	8.6E-008	—	2.8E-007	3.7E-007	Dibenzo(a,h)anthracene	—	—	—	—	—
			Aldrin	3.5E-008	—	8.8E-008	1.2E-007	Aldrin	Liver	8.0E-004	—	2.0E-003	2.8E-003
			Dieldrin	6.0E-008	—	1.5E-007	2.1E-007	Dieldrin	Liver	8.8E-004	—	2.2E-003	3.1E-003
			Methoxychlor	—	—	—	—	Methoxychlor	Reproductive	1.2E-002	—	2.8E-002	4.1E-002
			Aroclor-1248	3.5E-007	—	1.2E-006	1.6E-006	Aroclor-1248	—	—	—	—	—
			Aroclor-1260	2.6E-008	—	9.1E-008	1.2E-007	Aroclor-1260	—	—	—	—	—
			2,3,7,8-TCDD equiv.	2.4E-007	—	1.8E-007	4.2E-007	2,3,7,8-TCDD equiv.	—	—	—	—	—
			Antimony	—	—	—	—	Antimony	Whole body/blood	4.8E-003	—	1.2E-003	6.0E-003
			Arsenic	1.2E-005	—	9.5E-006	2.2E-005	Arsenic	Skin	7.3E-001	—	5.5E-001	1.3E+000
			(Total)	1.4E-005	—	1.8E-005	2.9E-005	(Total)	—	7.5E-001	—	5.5E-001	1.3E+000
Building Materials	Building Materials	AOC 2 - ADC	Benzo(a)anthracene	4.1E-008	—	1.4E-005	1.8E-005	Benzo(a)anthracene	—	—	—	—	—
			Benzo(b)fluoranthene	5.2E-008	—	1.7E-005	2.2E-005	Benzo(b)fluoranthene	—	—	—	—	—
			Benzo(a)pyrene	4.1E-005	—	1.4E-004	1.8E-004	Benzo(a)pyrene	—	—	—	—	—
			Indeno(1,2,3-cd)pyrene	1.1E-008	—	3.7E-006	4.8E-006	Indeno(1,2,3-cd)pyrene	—	—	—	—	—
			Dibenzo(a,h)anthracene	3.4E-008	—	1.1E-005	1.4E-005	Dibenzo(a,h)anthracene	—	—	—	—	—
			Naphthalene	—	—	—	—	Naphthalene	Whole body	9.8E-004	—	3.1E-003	4.1E-003
			2-Methylnaphthalene	—	—	—	—	2-Methylnaphthalene	Whole body	3.3E-003	—	1.1E-002	1.4E-002
			Acenaphthene	—	—	—	—	Acenaphthene	Liver	8.0E-004	—	2.6E-003	3.4E-003
			Dibenzofuran	—	—	—	—	Dibenzofuran	—	1.5E-002	—	4.9E-002	6.4E-002
			Fluorene	—	—	—	—	Fluorene	Blood	2.4E-003	—	7.8E-003	1.0E-002
			Fluoranthene	—	—	—	—	Fluoranthene	Kidney/liver	5.9E-003	—	1.9E-002	2.5E-002
			Pyrene	—	—	—	—	Pyrene	Kidney	5.6E-003	—	1.8E-002	2.4E-002
			Methoxychlor	—	—	—	—	Methoxychlor	Reproductive	1.8E-003	—	4.5E-003	6.3E-003
			Antimony	—	—	—	—	Antimony	Whole body/blood	8.6E-004	—	2.1E-007	8.6E-004
			Arsenic	6.4E-007	—	4.9E-007	1.1E-006	Arsenic	Skin	1.7E-002	—	1.3E-002	3.0E-002
			Copper	—	—	—	—	Copper	—	7.4E-004	—	1.9E-004	9.3E-004
			Manganese	—	—	—	—	Manganese	—	1.2E-003	—	3.1E-004	1.5E-003
			Thallium	—	—	—	—	Thallium	Liver/blood	1.5E-003	—	3.9E-004	1.9E-003
			Zinc	—	—	—	—	Zinc	Blood	6.1E-004	—	1.5E-004	7.6E-004
			(Total)	5.5E-005	—	1.8E-004	2.4E-004	(Total)	—	5.7E-002	—	1.3E-001	1.9E-001
Surface Water	Surface Water	AOC 2 - ADC	Vinyl Chloride	4.8E-008	—	6.4E-008	5.4E-008	Vinyl Chloride	—	—	—	—	—
			Antimony	—	—	—	—	Antimony	Whole body/blood	7.2E-004	—	1.3E-006	7.3E-004
			Arsenic	1.8E-008	—	3.3E-008	1.8E-008	Arsenic	Skin	4.7E-002	—	8.6E-004	4.8E-002
			Manganese	—	—	—	—	Manganese	—	8.4E-004	—	1.5E-005	8.5E-004
			Thallium	—	—	—	—	Thallium	Liver/blood	9.9E-004	—	1.8E-005	1.0E-003
			(Total)	1.8E-008	—	3.8E-008	1.9E-008	(Total)	—	4.9E-002	—	9.0E-004	6.0E-002
Sediment	Sediment	AOC 2 - ADC	Benzo(a)pyrene	4.4E-007	—	5.4E-007	9.8E-007	Benzo(a)pyrene	—	—	—	—	—
			Methoxychlor	—	—	—	—	Methoxychlor	Reproductive	1.5E-002	—	1.4E-002	2.9E-002
			Arsenic	5.2E-005	—	1.5E-005	6.7E-005	Arsenic	Skin	1.4E+000	—	3.8E-001	1.8E+000
			(Total)	6.3E-005	—	1.6E-005	8.0E-005	(Total)	—	1.4E+000	—	4.0E-001	1.8E+000

Total Risk Across All Media and All Exposure Routes  
3.3E-004

Total Hazard Index Across All Media and All Exposure Routes

Total (Skin) HI = 3.1E+000  
Total (Kidney) HI = 4.9E-002  
Total (Reproductive) HI = 7.8E-002

400376

TABLE 9.1.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 2 - ADC						Benzo(a)anthracene	-	-	-	-	-
								Benzo(b)fluoranthene	-	-	-	-	-
								Benzo(a)pyrene	-	-	-	-	-
								Indeno(1,2,3-cd)pyrene	-	-	-	-	-
								Dibenzo(a,h)anthracene	-	-	-	-	-
								Aldrin	Liver	2.3E-004	-	5.7E-004	8.0E-004
								Dieldrin	Liver	2.4E-004	-	6.0E-004	8.4E-004
								Methoxychlor	Reproductive	8.7E-004	-	2.2E-003	3.1E-003
								Aroclor-1248	-	-	-	-	-
								Aroclor-1260	-	-	-	-	-
								2,3,7,8-TCDD equiv.	-	-	-	-	-
								Antimony	Whole body/blood	4.1E-004	-	1.0E-004	5.1E-004
								Arsenic	Skin	9.2E-003	-	6.9E-003	1.6E-002
										1.1E-002	-	1.0E-002	2.1E-002
Building Materials	Building Materials	AOC 2 - ADC	Benzo(a)anthracene	8.9E-007	-	5.8E-006	6.7E-006						
			Benzo(b)fluoranthene	1.0E-006	-	6.7E-006	7.7E-006						
			Benzo(a)pyrene	8.1E-006	-	5.3E-005	6.1E-005						
			Indeno(1,2,3-cd)pyrene	2.8E-007	-	1.8E-006	2.1E-006						
			Dibenzo(a,h)anthracene	8.1E-007	-	5.2E-006	6.0E-006						
			Naphthalene	-	-	-	-						
			2-Methylnaphthalene	-	-	-	-						
			Acenaphthene	-	-	-	-						
			Dibenzofuran	-	-	-	-						
			Fluorene	-	-	-	-						
			Fluoranthene	-	-	-	-						
			Pyrene	-	-	-	-						
			Methoxychlor	-	-	-	-						
			Antimony	-	-	-	-						
			Arsenic	1.8E-010	-	2.7E-007	2.7E-007						
			Copper	-	-	-	-						
			Manganese	-	-	-	-						
			Thallium	-	-	-	-						
			Zinc	-	-	-	-						
			(Total)	1.1E-005	-	7.2E-005	8.3E-005						
Sediment	Sediment	AOC 2 - ADC						Benzo(a)pyrene	-	-	-	-	-
								Methoxychlor	Reproductive	1.4E-003	-	1.2E-003	2.6E-003
								Arsenic	Skin	2.7E-001	-	7.4E-002	3.4E-001
								(Total)		2.7E-001	-	7.6E-002	3.4E-001

400377

TABLE 9.1.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 3 - SPD	Benzo(a)anthracene	6.3E-008	-	2.1E-008	2.7E-008	Benzo(a)anthracene	-	-	-	-	
			Benzo(b)fluoranthene	1.1E-008	-	3.8E-008	4.7E-008	Benzo(b)fluoranthene	-	-	-	-	
			Benzo(a)pyrene	5.5E-008	-	1.9E-007	2.4E-007	Benzo(a)pyrene	-	-	-	-	
			Indeno(1,2,3-cd)pyrene	4.8E-008	-	1.8E-008	2.1E-008	Indeno(1,2,3-cd)pyrene	-	-	-	-	
			Methoxychlor	-	-	-	-	Methoxychlor	7.8E-003	-	2.0E-002	2.8E-002	
			Aluminum	-	-	-	-	Aluminum	5.1E-004	-	1.3E-004	6.4E-004	
			Antimony	-	-	-	-	Antimony	2.8E-003	-	8.4E-004	3.2E-003	
			Arsenic	1.8E-007	-	1.4E-007	3.2E-007	Arsenic	4.8E-003	-	3.8E-003	8.4E-003	
			Copper	-	-	-	-	Copper	2.3E-003	-	5.7E-004	2.9E-003	
			Manganese	-	-	-	-	Manganese	5.4E-004	-	1.3E-004	6.7E-004	
			Thallium	-	-	-	-	Thallium	7.9E-004	-	2.0E-004	9.9E-004	
			Vanadium	-	-	-	-	Vanadium	3.2E-004	-	7.9E-005	4.0E-004	
			(Total)	2.8E-007	-	3.9E-007	6.5E-007	(Total)	2.0E-002	-	2.6E-002	4.4E-002	
Surface Water	Surface Water	AOC 3 - SPD	Methoxychlor	-	-	-	-	Methoxychlor	5.5E-008	-	1.7E-008	7.2E-008	
			Aluminum	-	-	-	-	Aluminum	7.8E-008	-	1.4E-008	7.9E-008	
			Arsenic	3.9E-008	-	7.0E-010	3.9E-008	Arsenic	8.9E-004	-	1.8E-005	1.0E-003	
			Copper	-	-	-	-	Copper	1.9E-004	-	3.4E-006	1.9E-004	
			Manganese	-	-	-	-	Manganese	1.1E-003	-	2.1E-006	1.1E-003	
			Vanadium	-	-	-	-	Vanadium	3.2E-005	-	6.8E-007	3.3E-005	
			(Total)	3.9E-008	-	7.0E-010	3.9E-008	(Total)	2.4E-003	-	4.6E-006	2.5E-003	
Sediment	Sediment	AOC 3 - SPD	Benzo(b)fluoranthene	8.8E-008	-	8.1E-008	1.5E-008	Benzo(b)fluoranthene	-	-	-	-	
			Benzo(a)pyrene	4.8E-008	-	5.6E-008	1.0E-007	Benzo(a)pyrene	-	-	-	-	
			Dibenzo(a,h)anthracene	9.5E-008	-	1.2E-008	2.2E-008	Dibenzo(a,h)anthracene	-	-	-	-	
			Aroclor 1254	1.4E-008	-	1.8E-008	-	Aroclor 1254	4.1E-004	-	5.2E-004	9.3E-004	
			Heptachlor	9.9E-008	-	9.3E-008	-	Heptachlor	5.3E-005	-	4.8E-005	1.0E-004	
			Methoxychlor	-	-	-	-	Methoxychlor	3.1E-003	-	2.9E-003	6.0E-003	
			Aluminum	-	-	-	-	Aluminum	1.8E-008	-	1.6E-004	1.6E-004	
			Antimony	-	-	-	-	Antimony	6.9E-004	-	6.3E-005	7.5E-004	
			Arsenic	1.5E-007	-	4.1E-008	1.9E-007	Arsenic	8.7E-003	-	2.4E-003	1.1E-002	
			Copper	-	-	-	-	Copper	2.4E-003	-	2.2E-004	2.6E-003	
			Manganese	-	-	-	-	Manganese	1.4E-003	-	1.3E-004	1.5E-003	
			Vanadium	-	-	-	-	Vanadium	8.2E-004	-	7.8E-005	9.0E-004	
			(Total)	2.2E-007	-	1.3E-007	3.5E-007	(Total)	1.9E-002	-	6.8E-003	2.4E-002	
Total Risk Across All Media				3.5E-007				Total Hazard Index Across All Media and All Exposure Routes					7.1E-002
Total Risk Across All Media and All Exposure Routes				1.0E-006									

TABLE 8.1.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient									
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total					
Soil	Surface Soil	AOC 4 - ARC	Benzo(b)fluoranthene	9.7E-008	--	3.2E-008	4.2E-008	Benzo(b)fluoranthene	--	--	--	--	--					
			Benzo(a)pyrene	6.7E-008	--	2.2E-007	2.9E-007	Benzo(a)pyrene	--	--	--	--	--					
			Hexachlorobutadiene	2.7E-008	--	8.9E-008	9.6E-008	Hexachlorobutadiene	Kidney	2.0E-003	--	8.1E-003	7.1E-003					
			Hexachlorocyclopentadiene	--	--	--	--	Hexachlorocyclopentadiene	Stomach	4.9E-004	--	1.2E-003	1.7E-003					
			Aldrin	1.9E-008	--	4.9E-008	6.8E-008	Aldrin	Liver	4.4E-005	--	1.1E-004	1.5E-004					
			Aroclor-1248	9.1E-008	--	3.2E-008	4.1E-008	Aroclor-1248	--	--	--	--	--					
			Aroclor-1254	2.0E-008	--	7.1E-008	9.1E-008	Aroclor-1254	Immune	5.8E-003	--	2.0E-002	2.6E-002					
			Aroclor-1260	4.7E-008	--	1.7E-008	2.2E-008	Aroclor-1260	--	--	--	--	--					
			2,3,7,8-TCDD equiv.	1.5E-007	--	1.2E-007	2.7E-007	2,3,7,8-TCDD equiv.	--	--	--	--	--					
			Aluminum	--	--	--	--	Aluminum	--	9.3E-004	--	2.3E-004	1.2E-003					
			Antimony	--	--	--	--	Antimony	Whole body/blood	2.7E-003	--	8.8E-004	3.4E-003					
			Arsenic	2.1E-007	--	1.8E-007	3.7E-007	Arsenic	Skin	5.4E-003	--	4.1E-003	9.5E-003					
			Cadmium	--	--	--	--	Cadmium	Kidney	2.2E-003	--	5.8E-005	2.3E-003					
			Copper	--	--	--	--	Copper	--	8.9E-004	--	2.2E-004	1.1E-003					
			Manganese	--	--	--	--	Manganese	--	1.2E-003	--	2.9E-004	1.5E-003					
			Nickel	--	--	--	--	Nickel	Body organs	8.8E-004	--	2.2E-004	1.1E-003					
			Silver	--	--	--	--	Silver	Skin	3.4E-003	--	8.8E-004	4.3E-003					
			Thallium	--	--	--	--	Thallium	Liver/blood	8.2E-004	--	1.8E-004	7.7E-004					
			Zinc	--	--	--	--	Zinc	Blood	1.8E-003	--	4.8E-004	2.3E-003					
			(Total)				4.7E-007	--	6.8E-007	1.1E-006	(Total)				2.8E-002	--	3.4E-002	6.3E-002
Building Materials	Building Materials	AOC 4 - ARC	Aroclor-1254	3.1E-007	--	1.1E-008	1.4E-008	Aroclor-1254	Immune	9.0E-002	--	3.2E-001	4.1E-001					
			2,3,7,8-TCDD equiv.	1.3E-005	--	9.9E-006	2.3E-005	2,3,7,8-TCDD equiv.	--	--	--	--	--					
			Antimony	--	--	--	--	Antimony	Whole body/blood	4.8E+000	--	1.2E+000	6.0E+000					
			Arsenic	1.9E-008	--	1.5E-008	3.4E-008	Arsenic	Skin	5.1E-002	--	3.8E-002	8.9E-002					
			(Total)				1.5E-005	--	1.3E-005	2.8E-005	(Total)				4.9E+000	--	1.5E+000	6.4E+000
Surface Water	Surface Water	AOC 4 - ARC	Antimony	--	--	--	--	Antimony	Whole body/blood	6.9E-003	--	1.3E-004	7.0E-003					
			Arsenic	5.1E-008	--	9.2E-010	5.2E-008	Arsenic	Skin	1.3E-003	--	2.4E-006	1.3E-003					
			Cadmium	--	--	--	--	Cadmium	Kidney	5.1E-004	--	9.4E-008	5.2E-004					
			Copper	--	--	--	--	Copper	--	8.2E-004	--	1.7E-005	9.4E-004					
			Manganese	--	--	--	--	Manganese	--	9.1E-004	--	1.7E-006	9.3E-004					
			Nickel	--	--	--	--	Nickel	Body organs	1.9E-004	--	3.5E-007	1.9E-004					
			Silver	--	--	--	--	Silver	Skin	2.3E-004	--	2.5E-006	2.3E-004					
			(Total)				5.1E-008	--	9.2E-010	5.2E-008	(Total)				1.1E-002	--	2.0E-004	1.1E-002
Sediment	Sediment	AOC 4 - ARC	Benzo(a)pyrene	7.3E-008	--	8.9E-008	1.6E-007	Benzo(a)pyrene	--	--	--	--	--					
			Dieldrin	6.6E-008	--	8.2E-008	1.3E-008	Dieldrin	Liver	--	--	--	--	--				
			Aroclor-1248	4.2E-008	--	5.5E-008	9.7E-008	Aroclor-1248	--	--	--	--	--					
			Aroclor-1254	1.2E-008	--	1.5E-008	2.7E-008	Aroclor-1254	Immune	3.5E-001	--	4.4E-001	7.9E-001					
			Aroclor-1260	4.2E-008	--	5.5E-008	9.7E-008	Aroclor-1260	--	--	--	--	--					
			2,3,7,8-TCDD equiv.	1.2E-007	--	3.4E-008	1.5E-007	2,3,7,8-TCDD equiv.	--	--	--	--	--					
			Antimony	--	--	--	--	Antimony	Whole body/blood	7.8E-003	--	7.2E-004	8.5E-003					
			Arsenic	7.4E-007	--	2.1E-007	9.5E-007	Arsenic	Skin	2.0E-002	--	5.4E-003	2.5E-002					
			Copper	--	--	--	--	Copper	--	4.5E-003	--	4.1E-004	4.9E-003					
			Silver	--	--	--	--	Silver	Skin	7.7E-003	--	7.1E-004	8.4E-003					
			(Total)				2.2E-006	--	2.0E-006	4.1E-006	(Total)				3.8E-001	--	4.5E-001	8.3E-001
			Total Risk Across All Media and All Exposure Routes				3.3E-005				Total Hazard Index Across All Media and All Exposure Routes				7.3E+000			

Total (Skin) HI = 1.4E-001  
Total (Whole Body/blood) HI = 6.0E+000  
Total (Immune) HI = 1.2E+000

TABLE 9.1.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Building Materials	Building Materials	AOC 4 - ARC						Aroclor-1254	Immune	8.4E-003	--	5.9E-002	6.7E-002
								2,3,7,8-TCDD equiv.	--	--	--	--	--
								Antimony	Whole body/blood	6.8E-001	--	3.4E-001	1.0E+000
								Arsenic	Skin	1.6E-002	--	2.3E-002	3.9E-002
									(Total)	7.0E-001	--	4.2E-001	1.1E+000

TABLE 9.1 RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	Exposure		Primary	Ingestion	Inhalation	Dermal	Exposure			
Surface Water	Surface Water	AOC 5 - DSM	Arsenic	2.2E-008	--	4.0E-008	2.3E-008	Arsenic	Skin	6.7E-002	--	1.0E-003	5.8E-002			
			Manganese	--	--	--	Manganese	--	1.5E-003	--	2.7E-005	1.5E-003				
			(Total)	2.2E-008	--	4.0E-008	2.3E-008	(Total)		5.8E-002	--	1.1E-003	5.9E-002			
Sediment	Sediment	AOC 5 - DSM	Benzo(a)anthracene	2.2E-009	--	2.7E-009	4.9E-009	Benzo(a)anthracene	--	--	--	--	--			
			Benzo(b)fluoranthene	5.3E-009	--	6.5E-009	1.2E-008	Benzo(b)fluoranthene	--	--	--	--	--			
			Benzo(a)pyrene	2.2E-008	--	2.7E-008	4.9E-008	Benzo(a)pyrene	--	--	--	--	--			
			Indeno(1,2,3-cd)pyrene	1.6E-008	--	2.0E-008	3.6E-008	Indeno(1,2,3-cd)pyrene	--	--	--	--	--			
			Aroclor-1254	9.4E-009	--	1.2E-008	2.1E-008	Aroclor-1254	Immune	2.8E-003	--	3.6E-003	6.4E-003			
			Arsenic	6.0E-005	--	1.7E-005	7.7E-005	Arsenic	Skin	1.6E+000	--	4.4E-001	2.0E+000			
			(Total)	6.4E-005	--	1.7E-005	8.1E-005	(Total)		1.6E+000	--	4.5E-001	2.1E+000			
			Total Risk Across [Media]				Total Risk Across All Media and All Exposure Routes				Total Hazard Index Across All Media and All Exposure Routes					2.1E+000
							8.3E-005									

Total [Skin] HI = 2.1E+000  
Total [Immune] HI = 6.4E-003



TABLE 9.1.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure
Sediment	Sediment	AOC 5 - DSM						Benzo(a)anthracene	-	-	-	-	-
								Benzo(b)fluoranthene	-	-	-	-	-
								Benzo(a)pyrene	-	-	-	-	-
								Indeno(1,2,3-cd)pyrene	-	-	-	-	-
								Aroclor-1254	Immune	2.3E-003	-	3.0E-003	5.3E-003
								Arsenic	Skin	7.7E-001	-	2.1E-001	9.7E-001
								(Total)		7.7E-001	-	2.1E-001	9.8E-001

TABLE 9.1.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	AOC 6 - RR	Aluminum	--	--	--	--	Aluminum	--	6.9E-005	--	1.3E-008	7.0E-005
			Antimony	--	--	--	--	Antimony	Whole body/blood	4.3E-004	--	7.8E-008	4.4E-004
			Arsenic	7.8E-008	--	1.4E-009	7.9E-008	Arsenic	Skin	2.0E-003	--	3.7E-005	2.0E-003
			Copper	--	--	--	--	Copper	--	1.9E-004	--	3.4E-008	1.9E-004
			Manganese	--	--	--	--	Manganese	--	1.3E-004	--	2.3E-008	1.3E-004
			Thallium	--	--	--	--	Thallium	Liver/blood	2.1E-003	--	3.9E-008	2.1E-003
			Vanadium	--	--	--	--	Vanadium	None	8.0E-005	--	1.6E-008	8.2E-005
			(Total)	7.8E-008	--	1.4E-009	7.9E-008	(Total)	--	5.0E-003	--	9.2E-005	5.1E-003
Sediment	Sediment	AOC 6 - RR	Arsenic	3.3E-005	--	9.3E-008	4.2E-005	Arsenic	Skin	8.8E-001	--	2.4E-001	1.1E+000
			Copper	--	--	--	Copper	--	1.1E-002	--	9.8E-004	1.2E-002	
			(Total)	3.3E-005	--	9.3E-008	4.2E-005	(Total)	--	8.9E-001	--	2.4E-001	1.1E+000
Total Risk Across Media				4.2E-005				Total Hazard Index Across All Media and All Exposure Routes					1.1E+000
Total Risk Across All Media and All Exposure Routes							4.2E-005						

Total [Skin] HI = 1.1E+000  
Total [Liver/blood] HI = 2.1E-003  
Total [Whole body/blood] HI = 4.4E-004

TABLE 9.1.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	AOC 6 - RR						Arsenic	Skin	1.8E-001	-	4.6E-002	2.3E-001
								Copper	-	4.7E-003	-	4.3E-004	5.1E-003
								(Total)		1.8E-001	-	4.6E-002	2.3E-001

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TABLE 9.2a.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Residents  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure		Primary	Ingestion	Inhalation	Dermal	Exposure
Surface Water	Shellfish	AOC 5 - DSM	Arsenic	1.2E-008	--	--	1.2E-008	Arsenic	Skin	7.4E-006	--	--	7.4E-006
			Manganese	--	--	--	Manganese	--	2.6E-006	--	--	2.6E-006	
			(Total)	1.2E-008	--	--	1.2E-008	(Total)	1.0E-005	--	--	1.0E-005	
Surface Water	Surface Water	AOC 5 - DSM	Arsenic	3.5E-005	--	1.6E-005	5.1E-005	Arsenic	Skin	2.3E-001	--	1.1E-001	3.4E-001
			Manganese	--	--	--	Manganese	--	6.0E-003	--	2.8E-003	8.8E-003	
			(Total)	3.5E-005	--	1.6E-005	5.1E-005	(Total)	2.3E-001	--	1.1E-001	3.4E-001	
Sediment	Sediment	AOC 5 - DSM	Benzo(a)anthracene	7.0E-009	--	2.3E-008	3.0E-008	Benzo(a)anthracene	--	--	--	--	--
			Benzo(b)fluoranthene	1.7E-008	--	5.6E-008	7.3E-008	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(a)pyrene	7.0E-008	--	2.3E-007	3.0E-007	Benzo(a)pyrene	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	5.1E-009	--	1.7E-008	2.2E-008	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Aroclor-1254	3.0E-008	--	1.1E-007	1.4E-007	Aroclor-1254	Immune	2.2E-003	--	7.9E-003	1.0E-002
			Arsenic	1.9E-004	--	1.5E-004	3.4E-004	Arsenic	Skin	1.3E+000	--	9.7E-001	2.2E+000
			(Total)	1.9E-004	--	1.5E-004	3.4E-004	(Total)	1.3E+000	--	9.7E-001	2.2E+000	
			Total Risk Across Media				Total Hazard Index Across All Media and All Exposure Routes				Total Hazard Index Across All Media and All Exposure Routes		
Total Risk Across All Media and All Exposure Routes				3.9E-004				2.6E+000					

Total [Skin] HI = 2.6E+000  
Total [Immune] HI = 1.0E-002

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TABLE 9.2a.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Residents  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure
Sediment	Sediment	AOC 5 - DSM	Benzo(a)anthracene	2.8E-009	-	8.8E-009	1.1E-008	Benzo(a)anthracene	-	-	-	-	-
			Benzo(b)fluoranthene	3.6E-009	-	1.2E-008	1.6E-008	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	2.6E-008	-	8.8E-008	1.1E-007	Benzo(a)pyrene	-	-	-	-	-
			Indeno(1,2,3-cd)pyrene	1.9E-009	-	6.5E-009	8.4E-009	Indeno(1,2,3-cd)pyrene	-	-	-	-	-
			Aroclor-1254	9.3E-009	-	3.4E-008	4.3E-008	Aroclor-1254	Immune	1.8E-003	-	6.5E-003	8.3E-003
			Arsenic	3.5E-005	-	2.7E-005	6.1E-005	Arsenic	Skin	6.0E-001	-	4.6E-001	1.1E+000
			(Total)	3.5E-005	-	2.7E-005	6.1E-005	(Total)		6.0E-001	-	4.7E-001	1.1E+000

TABLE 9.2a.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Residents  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Shellfish	AOC 6 - RR	Aluminum	--	--	--	--	Aluminum	--	--	--	--	--
			Antimony	--	--	--	--	Antimony	Whole body/blood	1.3E-009	--	--	1.3E-009
			Arsenic	4.1E-010	--	--	4.1E-010	Arsenic	Skin	2.6E-007	--	--	2.6E-007
			Copper	--	--	--	--	Copper	--	1.1E-007	--	--	1.1E-007
			Manganese	--	--	--	--	Manganese	--	2.2E-007	--	--	2.2E-007
			Thallium	--	--	--	--	Thallium	Liver/blood	2.2E-007	--	--	2.2E-007
			Vanadium	--	--	--	--	Vanadium	None	--	--	--	--
			(Total)	4.1E-010	--	--	4.1E-010	(Total)	8.1E-007	--	--	8.1E-007	
Surface Water	Surface Water	AOC 6 - RR	Aluminum	--	--	--	--	Aluminum	--	2.8E-004	--	1.3E-004	4.1E-004
			Antimony	--	--	--	--	Antimony	Whole body/blood	1.7E-003	--	8.0E-004	2.5E-003
			Arsenic	1.2E-006	--	5.7E-007	1.8E-006	Arsenic	Skin	8.0E-003	--	3.7E-003	1.2E-002
			Copper	--	--	--	--	Copper	--	7.5E-004	--	3.5E-004	1.1E-003
			Manganese	--	--	--	--	Manganese	--	5.1E-004	--	2.4E-004	7.5E-004
			Thallium	--	--	--	--	Thallium	Liver/blood	8.6E-003	--	4.0E-003	1.3E-002
			Vanadium	--	--	--	--	Vanadium	None	3.2E-004	--	1.5E-004	4.7E-004
			(Total)	1.2E-006	--	5.7E-007	1.8E-006	(Total)	2.0E-002	--	9.4E-003	3.0E-002	
Sediment	Sediment	AOC 6 - RR	Arsenic	1.1E-004	--	8.0E-005	1.9E-004	Arsenic	Skin	6.9E-001	--	5.3E-001	1.2E+000
			Copper	--	--	--	--	Copper	--	8.4E-003	--	2.1E-003	1.0E-002
			(Total)	1.1E-004	--	8.0E-005	1.9E-004	(Total)	7.0E-001	--	5.3E-001	1.2E+000	
Total Risk Across Media							Total Hazard Index Across All Media and All Exposure Routes						
Total Risk Across All Media and All Exposure Routes							1.3E+000						

Total [Skin] HI = 1.2E+000  
Total [Liver] HI = 1.3E-002  
Total [Whole body] HI = 2.5E-003

TABLE 9.2a.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Residents  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	AOC 6 - RR	Arsenic	8.1E-006	-	6.3E-006	1.4E-005	Arsenic	Skin	1.4E-001	-	1.1E-001	2.5E-001
			Copper	-	-	-	-	Copper	-	3.7E-003	-	9.4E-004	4.6E-003
			(Total)	8.1E-006	-	6.3E-006	1.4E-005	(Total)	-	1.4E-001	-	1.1E-001	2.5E-001

TABLE 9.2b RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Residents  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	Exposure		Primary	Ingestion	Inhalation	Dermal	Exposure			
Surface Water	Surface Water	AOC 5 - DSM	Arsenic	4.2E-005	--	6.7E-006	4.8E-005	Arsenic	Skin	1.1E+000	--	1.7E-001	1.3E+000			
			Manganese	--	--	--	Manganese	--	2.8E-002	--	4.5E-003	3.3E-002				
			(Total)	4.2E-005	--	6.7E-006	4.8E-005	(Total)	1.1E+000	--	1.7E-001	1.3E+000				
Sediment	Sediment	AOC 5 - DSM	Benzo(a)anthracene	1.6E-008	--	1.7E-008	3.3E-008	Benzo(a)anthracene	--	--	--	--	--			
			Benzo(b)fluoranthene	4.0E-008	--	4.2E-008	8.2E-008	Benzo(b)fluoranthene	--	--	--	--	--			
			Benzo(a)pyrene	1.6E-007	--	1.7E-007	3.3E-007	Benzo(a)pyrene	--	--	--	--	--			
			Indeno(1,2,3-cd)pyrene	1.2E-008	--	1.3E-008	2.5E-008	Indeno(1,2,3-cd)pyrene	--	--	--	--	--			
			Aroclor-1254	7.1E-008	--	7.9E-008	1.5E-007	Aroclor-1254	Immune	2.1E-002	--	2.3E-002	4.4E-002			
			Arsenic	4.5E-004	--	1.1E-004	5.6E-004	Arsenic	Skin	1.2E+001	--	2.8E+000	1.5E+001			
			(Total)	4.5E-004	--	1.1E-004	5.6E-004	(Total)	1.2E+001	--	2.8E+000	1.5E+001				
			Total Risk Across [Media]				6.1E-004				Total Hazard Index Across All Media and All Exposure Routes					1.6E+001
			Total Risk Across All Media and All Exposure Routes				6.1E-004									

Total [Skin] HI = 1.6E+001  
Total [Immune] HI = 4.4E-002

400389



TABLE 9.2b.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Residents  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	AOC 5 - DSM	Benzo(a)anthracene	1.6E-008	-	1.7E-008	3.3E-008	Benzo(a)anthracene	-	-	-	-	-
			Benzo(b)fluoranthene	2.2E-008	-	2.3E-008	4.5E-008	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	1.6E-007	-	1.7E-007	3.3E-007	Benzo(a)pyrene	-	-	-	-	-
			Indeno(1,2,3-cd)pyrene	1.2E-008	-	1.3E-008	2.5E-008	Indeno(1,2,3-cd)pyrene	-	-	-	-	-
			Aroclor-1254	5.8E-008	-	6.5E-008	1.2E-007	Aroclor-1254	Immune	1.7E-002	-	1.9E-001	2.1E-001
			Arsenic	2.2E-004	-	5.2E-005	2.7E-004	Arsenic	Skin	5.8E+000	-	1.3E+000	6.8E+000
			(Total)	2.2E-004	-	5.2E-005	2.7E-004	(Total)		5.8E+000	-	1.4E+000	7.0E+000

400390

TABLE 9.2b.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Residents  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient																		
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total														
Surface Water	Surface Water	AOC 6 - RR	Aluminum	--	--	--	--	Aluminum	--	2.8E-004	--	1.3E-004	4.1E-004														
			Antimony	--	--	--	--	Antimony	Whole body/blood	1.7E-003	--	8.0E-004	2.5E-003														
			Arsenic	1.2E-006	--	5.7E-007	1.8E-006	Arsenic	Skin	8.0E-003	--	3.7E-003	1.2E-002														
			Copper	--	--	--	--	Copper	--	7.5E-004	--	3.5E-004	1.1E-003														
			Manganese	--	--	--	--	Manganese	--	5.1E-004	--	2.4E-004	7.5E-004														
			Thallium	--	--	--	--	Thallium	Liver/blood	8.6E-003	--	4.0E-003	1.3E-002														
			Vanadium	--	--	--	--	Vanadium	None	3.2E-004	--	1.5E-004	4.7E-004														
			(Total)	1.2E-006	--	5.7E-007	1.8E-006	(Total)	--	2.0E-002	--	9.4E-003	3.0E-002														
Sediment	Sediment	AOC 6 - RR	Arsenic	2.5E-004	--	5.9E-005	3.1E-004	Arsenic	Skin	6.5E+000	--	1.5E+000	8.0E+000														
			Copper	--	--	--	--	Copper	--	7.8E-002	--	6.2E-003	8.4E-002														
			(Total)	2.5E-004	--	5.9E-005	3.1E-004	(Total)	--	6.6E+000	--	1.5E+000	8.1E+000														
Total Risk Across [Media]				3.1E-004				Total Hazard Index Across All Media and All Exposure Routes					8.1E+000														
Total Risk Across All Media and All Exposure Routes							3.1E-004							Total Hazard Index Across All Media and All Exposure Routes							8.1E+000						

Total [Skin] HI = 8.0E+000  
Total [Liver] HI = 1.3E-002  
Total [Whole body] HI = 2.5E-003

400391

TABLE 9.2b.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Residents  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	AOC 6 - RR	Arsenic	5.1E-005	—	1.2E-005	6.3E-005	Arsenic	Skin	1.3E+000	—	3.2E-001	1.7E+000
			Copper	—	—	—	—	Copper	—	3.5E-002	—	2.8E-003	3.8E-002
			(Total)	5.1E-005	—	1.2E-005	6.3E-005	(Total)	—	1.4E+000	—	3.2E-001	1.7E+000

400392

TABLE 9.3.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil	Surface Soil	AOC 1 - HRDD	Dieldrin	3.5E-007	--	3.8E-008	4.2E-008	Dieldrin	Liver	1.2E-003	--	1.4E-002	1.5E-002		
			Aroclor-1248	3.4E-008	--	5.3E-005	5.6E-005	Aroclor-1248	--	--	--	--			
			Aroclor-1254	3.1E-007	--	4.8E-008	5.1E-008	Aroclor-1254	Immune	2.1E-002	--	3.4E-001	3.6E-001		
			Aroclor-1260	2.8E-007	--	4.0E-008	4.3E-008	Aroclor-1260	--	--	--	--			
			Aluminum	--	--	--	Aluminum	--	7.0E-003	--	8.1E-003	1.5E-002			
			Antimony	--	--	--	Antimony	Whole body/blood	4.2E-003	--	4.8E-003	9.0E-003			
			Arsenic	1.4E-005	--	4.8E-005	6.2E-005	Arsenic	Skin	8.7E-002	--	3.0E-001	3.9E-001		
			Cadmium	--	--	--	Cadmium	Kidney	2.2E-003	--	2.6E-004	2.6E-003			
			Copper	--	--	--	Copper	--	5.3E-003	--	8.2E-003	1.2E-002			
			Manganese	--	--	--	Manganese	--	8.6E-003	--	1.0E-002	1.9E-002			
			Nickel	--	--	--	Nickel	Body Organs	2.6E-003	--	3.1E-003	5.7E-003			
			Silver	--	--	--	Silver	Skin	2.9E-003	--	3.4E-003	6.3E-003			
			Thallium	--	--	--	Thallium	Liver/blood	7.0E-003	--	8.1E-003	1.5E-002			
			Vanadium	--	--	--	Vanadium	None	4.5E-003	--	5.2E-003	9.7E-003			
			(Total)	1.9E-005	--	1.1E-004	1.3E-004	(Total)	None	1.5E-001	--	7.0E-001	8.6E-001		
Soil	Subsurface Soil	AOC 1 - HRDD	Aroclor-1248	4.7E-007	--	7.3E-008	7.8E-008	Aroclor-1248	--	--	--	--			
			Aroclor-1254	3.5E-008	--	5.4E-007	5.8E-007	Aroclor-1254	Immune	2.4E-003	--	3.8E-002	4.0E-002		
			Aroclor-1260	1.1E-008	--	1.7E-005	1.8E-005	Aroclor-1260	--	--	--	--			
			Aluminum	--	--	--	Aluminum	--	5.2E-003	--	6.1E-003	1.1E-002			
			Antimony	--	--	--	Antimony	Whole body/blood	6.2E-003	--	7.3E-003	1.4E-002			
			Arsenic	6.6E-008	--	2.2E-005	2.9E-005	Arsenic	Skin	4.0E-002	--	1.4E-001	1.8E-001		
			Cadmium	--	--	--	Cadmium	Kidney	2.2E-003	--	2.5E-004	2.5E-003			
			Copper	--	--	--	Copper	--	1.5E-002	--	1.7E-002	3.2E-002			
			Manganese	--	--	--	Manganese	--	9.9E-003	--	1.2E-002	2.2E-002			
			Nickel	--	--	--	Nickel	Body Organs	4.3E-003	--	5.0E-003	9.3E-003			
			Thallium	--	--	--	Thallium	Liver/blood	1.8E-002	--	2.0E-002	3.8E-002			
			Vanadium	--	--	--	Vanadium	None	3.5E-003	--	4.1E-003	7.6E-003			
			(Total)	6.2E-008	--	4.7E-005	5.5E-005	(Total)	None	1.1E-001	--	2.5E-001	3.6E-001		
			Soil	Test Pit Soil	AOC 1 - HRDD	Benzo(a)pyrene	1.8E-008	--	2.60E-005	2.8E-005	Benzo(a)pyrene	--	--	--	--
						Aroclor-1248	1.5E-005	--	2.30E-004	2.5E-004	Aroclor-1248	--	--	--	--
Aroclor-1254	2.2E-008	--				3.50E-005	3.7E-005	Aroclor-1254	Immune	1.5E-001	--	2.5E+000	2.7E+000		
Antimony	--	--				--	Antimony	Whole body/blood	1.6E+000	--	1.9E+000	3.5E+000			
Arsenic	1.9E-004	--				6.40E-004	8.3E-004	Arsenic	Skin	1.2E+000	--	4.0E+000	5.2E+000		
(Total)	2.1E-004	--				9.3E-004	1.1E-003	(Total)	None	2.9E+000	--	8.4E+000	1.1E+001		
Total Risk Across All Media							Total Hazard Index Across All Media and All Exposure Routes								
Total Risk Across All Media and All Exposure Routes							Total [Skin] HI = 5.8E+000								
							Total [Immune] HI = 3.1E+000								
							Total [Whole Body/blood] HI = 3.5E+000								

TABLE 9.3.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Cardiogenic Risk				Chemical	Non-Cardiogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 1 - HRDD	Dieldrin	8.8E-009	-	1.8E-007	1.8E-007						
			Aroclor-1248	7.7E-008	-	2.2E-006	2.3E-006						
			Aroclor-1254	1.8E-008	-	5.2E-007	2.3E-006						
			Aroclor-1260	9.5E-009	-	2.7E-007	2.8E-007						
			Aluminum	-	-	-	-						
			Antimony	-	-	-	-						
			Arsenic	1.0E-006	-	6.3E-006	7.3E-006						
			Cadmium	-	-	-	-						
			Copper	-	-	-	-						
			Manganese	-	-	-	-						
			Nickel	-	-	-	-						
			Silver	-	-	-	-						
			Thallium	-	-	-	-						
			Vanadium	-	-	-	-						
			(Total)	1.1E-006	-	9.5E-006	1.1E-005						
Soil	Test Pit Soil	AOC 1 - HRDD	Benzo(a)pyrene	3.1E-008	-	8.2E-007	8.5E-007	Benzo(a)pyrene	-	-	-	-	-
			Aroclor-1248	1.8E-007	-	5.1E-006	5.3E-006	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	5.1E-008	-	1.5E-006	1.6E-006	Aroclor-1254	Immune	1.1E-002	-	2.8E-001	2.9E-001
			Antimony	-	-	-	-	Antimony	Whole body/blood	1.6E-003	-	2.9E-003	4.5E-003
			Arsenic	1.1E-006	-	7.0E-006	8.1E-006	Arsenic	Skin	2.2E-002	-	1.2E-001	1.4E-001
			(Total)	1.4E-006	-	1.4E-005	1.6E-005	(Total)		3.5E-002	-	4.0E-001	4.3E-001

TABLE 9.3.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 2 - ADC	Benzo(a)anthracene	2.8E-007	--	4.0E-005	4.0E-005	Benzo(a)anthracene	--	--	--	--	--
			Benzo(b)fluoranthene	3.9E-006	--	5.7E-005	6.1E-005	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(a)pyrene	2.6E-005	--	3.8E-004	4.1E-004	Benzo(a)pyrene	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	1.6E-006	--	2.3E-005	2.5E-005	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Dibenzo(a,h)anthracene	3.0E-006	--	4.4E-005	4.7E-005	Dibenzo(a,h)anthracene	--	--	--	--	--
			Aldrin	1.2E-006	--	1.4E-005	1.5E-005	Aldrin	Liver	6.5E-003	--	7.6E-002	8.3E-002
			Dieldrin	2.1E-006	--	2.4E-005	2.6E-005	Dieldrin	Liver	7.3E-003	--	8.4E-002	9.1E-002
			Methoxychlor	--	--	--	--	Methoxychlor	Reproductive	9.6E-002	--	1.1E+000	1.2E+000
			Aroclor-1248	1.2E-005	--	1.9E-004	2.0E-004	Aroclor-1248	--	--	--	--	--
			Aroclor-1260	9.0E-007	--	1.4E-005	1.5E-005	Aroclor-1260	--	--	--	--	--
			2,3,7,8-TCDD equiv.	6.3E-006	--	2.8E-005	3.6E-005	2,3,7,8-TCDD equiv.	--	--	--	--	--
			Antimony	--	--	--	--	Antimony	Whole body/blood	3.9E-002	--	4.6E-002	8.5E-002
			Arsenic	4.4E-004	--	1.5E-006	4.4E-004	Arsenic	Skin	5.9E+000	--	2.1E+001	2.7E+001
			(Total)	5.0E-004	--	8.1E-004	1.3E-003	(Total)		6.1E+000	--	2.2E+001	2.8E+001
Soil	Subsurface Soil	AOC 2 - ADC	1,2-Dichloroethane	6.4E-006	--	7.1E-004	7.2E-004	1,2-Dichloroethane	--	6.4E-003	--	7.4E-001	7.5E-001
			Benzo(b)fluoranthene	4.1E-007	--	6.0E-006	6.4E-006	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(a)pyrene	6.2E-006	--	8.9E-005	9.5E-005	Benzo(a)pyrene	--	--	--	--	--
			Methoxychlor	--	--	--	--	Methoxychlor	Reproductive	7.4E-002	--	8.7E-001	9.4E-001
			Aroclor-1242	3.8E-006	--	5.9E-005	6.3E-005	Aroclor-1242	--	--	--	--	--
			Aroclor-1248	2.7E-005	--	4.1E-004	4.4E-004	Aroclor-1248	--	--	--	--	--
			Arsenic	2.2E-004	--	7.5E-004	9.7E-004	Arsenic	Skin	1.4E+000	--	4.7E+000	6.1E+000
			Thallium	--	--	--	--	Thallium	Liver/blood	1.3E-002	--	1.5E-002	2.8E-002
			(Total)	2.7E-004	--	2.0E-003	2.3E-003	(Total)		1.4E+000	--	6.3E+000	7.8E+000
Building Materials	Building Materials	AOC 2 - ADC	Benzo(a)anthracene	1.4E-004	--	2.1E-003	2.2E-003	Benzo(a)anthracene	--	--	--	--	--
			Benzo(b)fluoranthene	1.6E-004	--	2.7E-003	2.9E-003	Benzo(b)fluoranthene	--	--	--	--	--
			Benzo(a)pyrene	1.4E-003	--	2.1E-002	2.2E-002	Benzo(a)pyrene	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	3.9E-005	--	5.7E-004	6.1E-004	Indeno(1,2,3-cd)pyrene	--	--	--	--	--
			Dibenzo(a,h)anthracene	1.2E-004	--	1.7E-003	1.8E-003	Dibenzo(a,h)anthracene	--	--	--	--	--
			Naphthalene	--	--	--	--	Naphthalene	Whole body	7.8E-003	--	1.2E-001	1.3E-001
			2-Methylnaphthalene	--	--	--	--	2-Methylnaphthalene	Whole body	2.7E-002	--	4.1E-001	4.4E-001
			Acenaphthene	--	--	--	--	Acenaphthene	Liver	6.5E-003	--	9.6E-002	1.1E-001
			Dibenzofuran	--	--	--	--	Dibenzofuran	--	1.2E-001	--	1.9E+000	2.0E+000
			Fluorene	--	--	--	--	Fluorene	Blood	2.0E-002	--	3.0E-001	3.2E-001
			Fluoranthene	--	--	--	--	Fluoranthene	Kidney/liver	4.8E-002	--	7.2E-001	7.7E-001
			Pyrene	--	--	--	--	Pyrene	Kidney	4.6E-002	--	6.9E-001	7.4E-001
			Methoxychlor	--	--	--	--	Methoxychlor	Reproductive	1.5E-002	--	1.7E-001	1.9E-001
			Antimony	--	--	--	--	Antimony	Whole body/blood	7.0E-003	--	8.1E-003	1.5E-002
			Arsenic	2.3E-005	--	7.8E-005	9.9E-005	Arsenic	Skin	1.4E-001	--	4.8E-001	6.2E-001
			Copper	--	--	--	--	Copper	--	6.1E-003	--	7.1E-003	1.3E-002
			Manganese	--	--	--	--	Manganese	--	1.0E-002	--	1.2E-002	2.2E-002
			Thallium	--	--	--	--	Thallium	Liver/blood	1.3E-002	--	1.5E-002	2.8E-002
			Zinc	--	--	--	--	Zinc	Blood	5.0E-003	--	5.8E-003	1.1E-002
			(Total)	2.0E-003	--	2.8E-002	3.0E-002	(Total)		4.7E-001	--	4.9E+000	5.4E+000
Total Risk Across All Media				3.4E-002				Total Hazard Index Across All Media and All Exposure Routes					4.1E+001

Total [Skin] HI = 3.4E+001  
Total [Kidney] HI = 1.5E+000  
Total [Reproductive] HI = 2.3E+000

TABLE 9.3.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 2 - ADC	Benzo(a)anthracene	7.6E-009	-	2.0E-006	2.0E-006	Benzo(a)anthracene	-	-	-	-	-
			Benzo(b)fluoranthene	1.3E-008	-	3.5E-006	3.5E-006	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	9.0E-008	-	2.4E-005	2.4E-005	Benzo(a)pyrene	-	-	-	-	-
			Indeno(1,2,3-cd)pyrene	5.5E-009	-	1.5E-006	1.5E-006	Indeno(1,2,3-cd)pyrene	-	-	-	-	-
			Dibenzo(a,h)anthracene	4.3E-008	-	1.1E-005	1.1E-005	Dibenzo(a,h)anthracene	-	-	-	-	-
			Aldrin	4.5E-009	-	9.1E-007	9.1E-007	Aldrin	Liver	7.6E-004	-	1.4E-002	1.5E-002
			Dieldrin	7.4E-009	-	1.5E-006	1.5E-006	Dieldrin	Liver	8.0E-004	-	1.4E-002	1.5E-002
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	2.9E-003	-	2.9E-003	5.8E-003
			Aroclor-1248	3.4E-008	-	9.7E-006	9.7E-006	Aroclor-1248	-	-	-	-	-
			Aroclor-1260	6.9E-009	-	2.0E-006	2.0E-006	Aroclor-1260	-	-	-	-	-
			2,3,7,8-TCDD equiv.	5.2E-008	-	3.2E-006	3.3E-006	2,3,7,8-TCDD equiv.	-	-	-	-	-
			Antimony	-	-	-	-	Antimony	Whole body/blood	1.4E-003	-	2.4E-003	3.8E-003
			Arsenic	7.1E-007	-	4.3E-006	5.0E-006	Arsenic	Skin	3.1E-002	-	1.7E-001	2.0E-001
			(Total)	9.7E-007	-	6.4E-005	6.5E-005	(Total)	Skin	3.6E-002	-	2.5E-001	2.9E-001
Soil	Subsurface Soil	AOC 2 - ADC	1,2-Dichloroethane	5.6E-008	-	1.1E-005	1.1E-005	1,2-Dichloroethane	-	1.7E-004	-	3.1E-002	3.1E-002
			Benzo(b)fluoranthene	8.2E-008	-	2.2E-007	2.3E-007	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	9.5E-008	-	2.5E-006	2.8E-006	Benzo(a)pyrene	-	-	-	-	-
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	2.8E-003	-	4.7E-002	5.0E-002
			Aroclor-1242	3.5E-009	-	1.0E-007	1.0E-007	Aroclor-1242	-	-	-	-	-
			Aroclor-1248	3.3E-007	-	9.6E-006	9.9E-006	Aroclor-1248	-	-	-	-	-
			Arsenic	7.2E-007	-	4.4E-006	5.1E-006	Arsenic	Skin	1.4E-002	-	7.6E-002	9.0E-002
			Thallium	-	-	-	-	Thallium	Liver/blood	2.9E-003	-	5.1E-003	8.0E-003
			(Total)	1.2E-006	-	2.8E-005	2.9E-005	(Total)	Liver/blood	2.0E-002	-	1.6E-001	1.6E-001
Building Materials	Building Materials	AOC 2 - ADC	Benzo(a)anthracene	7.9E-008	-	2.1E-004	2.2E-004	Benzo(a)anthracene	-	-	-	-	-
			Benzo(b)fluoranthene	9.1E-008	-	2.4E-004	2.5E-004	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	7.2E-005	-	1.9E-003	2.0E-003	Benzo(a)pyrene	-	-	-	-	-
			Indeno(1,2,3-cd)pyrene	2.5E-006	-	8.6E-005	8.9E-005	Indeno(1,2,3-cd)pyrene	-	-	-	-	-
			Dibenzo(a,h)anthracene	7.1E-006	-	1.9E-004	2.0E-004	Dibenzo(a,h)anthracene	-	-	-	-	-
			Naphthalene	-	-	-	-	Naphthalene	Whole body	1.0E-003	-	2.4E-002	2.5E-002
			2-Methylnaphthalene	-	-	-	-	2-Methylnaphthalene	Whole body	5.0E-003	-	1.2E-001	1.3E-001
			Acenaphthene	-	-	-	-	Acenaphthene	Liver	1.2E-003	-	2.8E-002	2.9E-002
			Dibenzofuran	-	-	-	-	Dibenzofuran	-	2.0E-002	-	4.7E-001	4.8E-001
			Fluorene	-	-	-	-	Fluorene	Blood	2.9E-003	-	8.8E-002	7.1E-002
			Fluoranthene	-	-	-	-	Fluoranthene	Kidney/liver	9.2E-003	-	2.1E-001	2.2E-001
			Pyrene	-	-	-	-	Pyrene	Kidney	9.4E-003	-	2.2E-001	2.2E-001
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	1.5E-003	-	2.7E-002	2.9E-002
			Antimony	-	-	-	-	Antimony	Whole body/blood	1.9E-003	-	3.3E-003	5.2E-003
			Arsenic	1.8E-006	-	9.7E-005	9.9E-005	Arsenic	Skin	3.1E-002	-	1.7E-001	2.0E-001
			Copper	-	-	-	-	Copper	-	1.3E-003	-	2.3E-003	3.6E-003
			Manganese	-	-	-	-	Manganese	-	2.0E-003	-	3.6E-003	5.6E-003
			Thallium	-	-	-	-	Thallium	Liver/blood	2.8E-003	-	4.8E-003	7.2E-003
			Zinc	-	-	-	-	Zinc	Blood	6.5E-004	-	1.2E-003	1.9E-003
			(Total)	1.0E-004	-	2.9E-003	2.7E-003	(Total)	Blood	6.9E-002	-	1.3E+000	1.4E+000

TABLE 9.3.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total			
Soil	Surface Soil	AOC 3 - SPD	Benzo(a)anthracene	2.2E-007	-	3.2E-008	3.4E-008	Benzo(a)anthracene	-	-	-	-	-			
			Benzo(b)fluoranthene	3.8E-007	-	5.5E-008	5.9E-008	Benzo(b)fluoranthene	-	-	-	-	-			
			Benzo(a)pyrene	1.9E-008	-	2.8E-005	3.0E-005	Benzo(a)pyrene	-	-	-	-	-			
			Indeno(1,2,3-cd)pyrene	1.7E-007	-	2.5E-008	2.7E-008	Indeno(1,2,3-cd)pyrene	-	-	-	-	-			
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	6.4E-002	-	7.4E-001	8.0E-001			
			Aluminum	-	-	-	-	Aluminum	-	4.1E-003	-	4.8E-003	8.9E-003			
			Antimony	-	-	-	-	Antimony	Whole body/blood	2.1E-002	-	2.4E-002	4.5E-002			
			Arsenic	6.5E-006	-	2.2E-005	2.9E-005	Arsenic	Skin	3.9E-002	-	1.4E-001	1.8E-001			
			Copper	-	-	-	-	Copper	-	1.9E-002	-	2.2E-002	4.1E-002			
			Manganese	-	-	-	-	Manganese	-	4.4E-003	-	5.1E-003	9.5E-003			
			Thallium	-	-	-	-	Thallium	Liver/blood	6.4E-003	-	7.5E-003	1.4E-002			
			Vanadium	-	-	-	-	Vanadium	None	2.6E-003	-	3.0E-003	5.8E-003			
			(Total)	9.2E-008	-	8.1E-005	7.0E-005	(Total)	-	1.8E-001	-	9.4E-001	1.1E+000			
			Soil	Subsurface Soil	AOC 3 - SPD	Benzo(a)pyrene	1.2E-007	-	1.8E-008	1.9E-008	Benzo(a)pyrene	-	-	-	-	-
Aroclor-1254	5.9E-008	-				9.2E-007	9.8E-007	Aroclor-1254	Immune	4.0E-003	-	6.5E-002	6.9E-002			
Aroclor-1260	8.3E-008	-				9.9E-007	1.1E-008	Aroclor-1260	-	-	-	-	-			
Methoxychlor	-	-				-	-	Methoxychlor	Reproductive	1.8E-003	-	2.1E-002	2.3E-002			
Aluminum	-	-				-	-	Aluminum	-	4.5E-003	-	5.2E-003	9.7E-003			
Antimony	-	-				-	-	Antimony	Whole body/blood	1.0E-003	-	1.2E-003	2.2E-003			
Arsenic	7.8E-006	-				2.6E-005	3.4E-005	Arsenic	Skin	4.7E-002	-	1.7E-001	2.2E-001			
Cadmium	-	-				-	-	Cadmium	Kidney	3.3E-004	-	3.8E-005	3.7E-004			
Manganese	-	-				-	-	Manganese	-	4.0E-003	-	4.7E-003	8.7E-003			
Thallium	-	-				-	-	Thallium	Liver/blood	6.4E-003	-	9.8E-003	1.8E-002			
Vanadium	-	-				-	-	Vanadium	None	2.3E-003	-	2.7E-003	-			
(Total)	8.1E-008	-				3.0E-005	3.8E-005	(Total)	-	7.4E-002	-	2.7E-001	3.5E-001			
Soil	Test Pit Soil	AOC 3 - SPD				Hexachloroethane	2.8E-005	-	2.9E-004	3.2E-004	Hexachloroethane	Kidney	5.0E+000	-	5.8E+001	6.3E+001
						Benzo(a)pyrene	6.2E-008	-	8.9E-005	9.5E-005	Benzo(a)pyrene	-	-	-	-	-
			Dibenz(a,h)anthracene	1.2E-008	-	1.7E-005	1.2E-008	Dibenz(a,h)anthracene	-	-	-	-	-			
			Aroclor-1248	7.6E-008	-	1.20E-004	1.3E-004	Aroclor-1248	-	-	-	-	-			
			Aroclor-1254	2.2E-008	-	3.40E-005	3.6E-005	Aroclor-1254	Immune	1.5E-001	-	2.4E+000	2.6E+000			
			Arsenic	2.1E-005	-	6.90E-005	9.0E-005	Arsenic	Skin	1.3E-001	-	4.4E-001	5.7E-001			
			Copper	-	-	-	-	Copper	-	4.0E-001	-	4.8E-001	8.8E-001			
			(Total)	6.4E-005	-	6.1E-004	6.8E-004	(Total)	-	5.7E+000	-	6.1E+001	6.7E+001			
Total Risk Across Media				Total Risk Across All Media and All Exposure Routes				Total Hazard Index Across All Media and All Exposure Routes				6.8E+001				
				7.0E-004												

Total [Skin] HI = 9.7E-001  
Total [Kidney] HI = 6.3E+001  
Total [Immune] HI = 2.6E+000

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TABLE 9.3.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Test Pit Soil	AOC 3 - SPD	Hexachloroethane	5.6E-010	--	1.2E-007	1.2E-007	Hexachloroethane	Kidney	3.5E-004	--	6.3E-003	6.7E-003
			Benzo(a)pyrene	3.4E-007	--	8.9E-008	9.2E-008	Benzo(a)pyrene	--	--	--	--	--
			Dibenzo(a,h)anthracene	1.5E-007	--	4.1E-008	1.5E-007	Dibenzo(a,h)anthracene	--	--	--	--	--
			Aroclor-1248	1.5E-007	--	4.40E-006	4.6E-006	Aroclor-1248	--	--	--	--	--
			Aroclor-1254	3.5E-008	--	1.0E-008	1.0E-008	Aroclor-1254	Immune	7.6E-003	--	1.8E-001	2.0E-001
			Arsenic	7.4E-007	--	4.50E-006	5.2E-006	Arsenic	Skin	1.4E-002	--	7.7E-002	9.1E-002
			Copper	--	--	--	--	Copper	--	1.8E-002	--	3.2E-002	5.0E-002
			(Total)	1.4E-006	--	2.3E-005	2.4E-005	(Total)	--	4.0E-002	--	3.1E-001	3.5E-001

TABLE 9.3.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total			
Soil	Surface Soil	AOC 4 - ARC	Benzo(b)fluoranthene	3.4E-007	--	4.9E-008	5.2E-008	Benzo(b)fluoranthene	--	--	--	--	--			
			Benzo(a)pyrene	2.4E-008	--	3.4E-005	3.6E-005	Benzo(a)pyrene	--	--	--	--	--			
			Hexachlorobutadiene	9.5E-008	--	1.1E-006	1.2E-006	Hexachlorobutadiene	Kidney	1.7E-002	--	1.9E-001	2.1E-001			
			Hexachlorocyclopentadiene	--	--	--	--	Hexachlorocyclopentadiene	Stomach	4.0E-003	--	4.7E-002	5.1E-002			
			Aldrin	6.7E-008	--	7.5E-007	8.2E-007	Aldrin	Liver	3.8E-004	--	4.2E-003	4.6E-003			
			Aroclor-1248	3.2E-007	--	5.0E-006	5.3E-006	Aroclor-1248	--	--	--	--	--			
			Aroclor-1254	7.0E-007	--	1.1E-005	1.2E-005	Aroclor-1254	Immune	4.8E-002	--	7.7E-001	8.2E-001			
			Aroclor-1260	1.7E-007	--	2.6E-006	2.8E-006	Aroclor-1260	--	--	--	--	--			
			2,3,7,8-TCDD equiv.	5.4E-006	--	1.8E-005	2.3E-005	2,3,7,8-TCDD equiv.	--	--	--	--	--			
			Aluminum	--	--	--	--	Aluminum	--	7.6E-003	--	8.8E-003	1.6E-002			
			Antimony	--	--	--	--	Antimony	Whole body/blood	2.2E-002	--	2.6E-002	4.8E-002			
			Arsenic	7.3E-006	--	2.4E-005	3.1E-005	Arsenic	Skin	4.4E-002	--	1.5E-001	1.9E-001			
			Cadmium	--	--	--	--	Cadmium	Kidney	1.8E-002	--	2.1E-003	2.0E-002			
			Copper	--	--	--	--	Copper	--	7.2E-003	--	8.4E-003	1.6E-002			
			Manganese	--	--	--	--	Manganese	--	9.4E-003	--	1.1E-002	2.0E-002			
			Nickel	--	--	--	--	Nickel	Body organs	7.3E-003	--	8.4E-003	1.6E-002			
			Silver	--	--	--	--	Silver	Skin	2.8E-002	--	3.3E-002	6.1E-002			
			Thallium	--	--	--	--	Thallium	Liver/blood	5.0E-003	--	5.9E-003	1.1E-002			
			Zinc	--	--	--	--	Zinc	Blood	1.5E-002	--	1.7E-002	3.2E-002			
			(Total)	1.7E-005	--	1.0E-004	1.2E-004	(Total)		2.3E-001	--	1.3E+000	1.5E+000			
Soil	Subsurface Soil	AOC 4 - ARC	Tetrachloroethene	1.8E-007	--	2.0E-005	2.0E-005	Tetrachloroethene	Liver	9.4E-004	--	1.1E-001	1.1E-001			
			Chlorobenzene	--	--	--	--	Chlorobenzene	Liver	7.3E-004	--	8.5E-002	8.6E-002			
			Benzo(a)anthracene	1.0E-007	--	1.5E-006	1.6E-006	Benzo(a)anthracene	--	--	--	--	--			
			Benzo(b)fluoranthene	1.1E-007	--	1.6E-006	1.7E-006	Benzo(b)fluoranthene	--	--	--	--	--			
			Benzo(a)pyrene	1.0E-006	--	1.5E-005	1.6E-005	Benzo(a)pyrene	--	--	--	--	--			
			Indeno(1,2,3-cd)pyrene	9.1E-008	--	1.3E-006	1.4E-006	Indeno(1,2,3-cd)pyrene	--	--	--	--	--			
			1,2,4-Trichlorobenzene	--	--	--	--	1,2,4-Trichlorobenzene	Adrenal	5.5E-003	--	6.4E-002	7.0E-002			
			Aldrin	1.7E-008	--	1.9E-007	2.1E-007	Aldrin	Liver	9.3E-005	--	1.1E-003	1.2E-003			
			Aroclor-1248	5.4E-008	--	8.3E-007	8.8E-007	Aroclor-1248	--	--	--	--	--			
			Aroclor-1254	2.0E-008	--	3.1E-007	3.3E-007	Aroclor-1254	Immune	1.4E-003	--	2.2E-002	2.3E-002			
			Aluminum	--	--	--	--	Aluminum	--	6.4E-003	--	7.4E-003	1.4E-002			
			Antimony	--	--	--	--	Antimony	Whole body/blood	2.6E-003	--	3.0E-003	5.6E-003			
			Arsenic	3.5E-006	--	1.2E-005	1.6E-005	Arsenic	Skin	2.1E-002	--	7.4E-002	9.5E-002			
			Manganese	--	--	--	--	Manganese	--	2.7E-003	--	3.2E-003	5.9E-003			
			Thallium	--	--	--	--	Thallium	Liver/blood	7.7E-003	--	9.0E-003	1.7E-002			
			Vanadium	--	--	--	--	Vanadium	None	3.0E-003	--	3.5E-003	6.5E-003			
			(Total)	5.1E-006	--	5.2E-005	5.7E-005	(Total)		5.2E-002	--	3.8E-001	4.3E-001			
			Building Materials	Building Materials	AOC 4 - ARC	Aroclor-1254	1.1E-005	--	1.7E-004	1.8E-004	Aroclor-1254	Immune	7.4E-001	--	1.2E+001	1.3E+001
						2,3,7,8-TCDD equiv.	4.6E-004	--	1.5E-003	2.0E-003	2,3,7,8-TCDD equiv.	--	--	--	--	--
						Antimony	--	--	--	--	Antimony	Whole body/blood	3.9E+001	--	4.5E+001	8.4E+001
Arsenic	6.9E-005	--				2.3E-004	3.0E-004	Arsenic	Skin	4.1E-001	--	1.4E+000	1.8E+000			
(Total)	5.4E-004	--				1.9E-003	2.5E-003	(Total)		4.0E+001	--	5.9E+001	9.9E+001			
Total Risk Across Media				2.7E-003				Total Hazard Index Across All Media and All Exposure Routes					1.0E+002			

Total Risk Across All Media and All Exposure Routes

2.7E-003

Total Hazard Index Across All Media and All Exposure Routes

Total (Skin) HI = 2.2E+000  
Total (Whole Body/blood) HI = 8.4E+001  
Total (Immune) HI = 1.4E+001

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TABLE 9.3.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 4 - ARC	Benzo(b)fluoranthene	2.8E-008	-	7.6E-007	7.9E-007	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	2.8E-007	-	7.3E-008	7.6E-008	Benzo(a)pyrene	-	-	-	-	-
			Hexachlorobutadiene	3.4E-009	-	6.9E-008	7.2E-008	Hexachlorobutadiene	Kidney	1.9E-003	-	3.4E-002	3.6E-002
			Hexachlorocyclopentadiene	-	-	-	-	Hexachlorocyclopentadiene	Stomach	2.4E-005	-	4.4E-004	4.6E-004
			Aldrin	6.3E-010	-	1.3E-008	1.4E-008	Aldrin	Liver	1.1E-005	-	1.9E-004	2.0E-004
			Aroclor-1248	2.0E-009	-	5.7E-008	5.9E-008	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	2.9E-009	-	8.2E-008	8.5E-008	Aroclor-1254	Immune	6.2E-004	-	1.6E-002	1.7E-002
			Aroclor-1280	2.0E-009	-	5.8E-008	6.0E-008	Aroclor-1280	-	-	-	-	-
			2,3,7,8-TCDD equiv.	4.1E-007	-	2.5E-008	2.9E-008	2,3,7,8-TCDD equiv.	-	-	-	-	-
			Aluminum	-	-	-	-	Aluminum	-	1.4E-003	-	2.5E-003	3.9E-003
			Antimony	-	-	-	-	Antimony	Whole body/blood	1.8E-003	-	3.2E-003	5.0E-003
			Arsenic	3.3E-007	-	2.5E-008	2.8E-008	Arsenic	Skin	6.5E-003	-	3.5E-002	4.2E-002
			Cadmium	-	-	-	-	Cadmium	Kidney	2.6E-004	-	4.7E-005	3.1E-004
			Copper	-	-	-	-	Copper	-	8.7E-004	-	1.6E-003	2.5E-003
			Manganese	-	-	-	-	Manganese	-	1.0E-003	-	1.8E-003	2.8E-003
			Nickel	-	-	-	-	Nickel	Body organs	2.1E-004	-	3.8E-004	5.9E-004
			Silver	-	-	-	-	Silver	Skin	2.6E-003	-	4.8E-003	7.4E-003
			Thallium	-	-	-	-	Thallium	Liver/blood	1.5E-003	-	2.7E-003	4.2E-003
			Zinc	-	-	-	-	Zinc	Blood	7.2E-005	-	1.3E-004	2.0E-004
			(Total)	1.1E-006	-	1.3E-005	1.4E-005	(Total)	(Total)	1.9E-002	-	1.0E-001	1.2E-001
Building Materials	Building Materials	AOC 4 - ARC	Aroclor-1254	2.8E-007	-	7.4E-008	7.7E-008	Aroclor-1254	Immune	5.6E-002	-	1.4E+000	1.5E+000
			2,3,7,8-TCDD equiv.	1.1E-005	-	6.8E-005	7.9E-005	2,3,7,8-TCDD equiv.	-	-	-	-	-
			Antimony	-	-	-	-	Antimony	Whole body/blood	4.5E+000	-	8.1E+000	1.3E+001
			Arsenic	5.3E-008	-	3.3E-005	3.6E-005	Arsenic	Skin	1.0E-001	-	5.6E-001	6.6E-001
			(Total)	1.7E-005	-	1.1E-004	1.2E-004	(Total)	(Total)	4.7E+000	-	1.0E+001	1.5E+001

TABLE 9.4.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil	Surface Soil	AOC 1 - HRDD	Dieldrin	3.3E-008	--	4.2E-008	7.5E-008	Dieldrin	Liver	2.9E-003	--	3.8E-003	6.7E-003		
			Aroclor-1248	3.2E-007	--	5.9E-007	9.1E-007	Aroclor-1248	--	--	--	--			
			Aroclor-1254	2.9E-008	--	5.2E-008	8.1E-008	Aroclor-1254	Immune	5.1E-002	--	9.5E-002	1.5E-001		
			Aroclor-1260	2.4E-008	--	4.4E-008	6.8E-008	Aroclor-1260	--	--	--	--			
			Aluminum	--	--	--	--	Aluminum	--	1.7E-002	--	2.3E-003	1.9E-002		
			Antimony	--	--	--	--	Antimony	Whole body/blood	1.0E-002	--	1.4E-003	1.1E-002		
			Arsenic	1.4E-008	--	5.2E-007	1.9E-008	Arsenic	Skin	2.1E-001	--	8.5E-002	3.0E-001		
			Cadmium	--	--	--	--	Cadmium	Kidney	5.4E-003	--	7.2E-005	5.5E-003		
			Copper	--	--	--	--	Copper	--	1.3E-002	--	1.7E-003	1.5E-002		
			Manganese	--	--	--	--	Manganese	--	2.1E-002	--	2.8E-003	2.4E-002		
			Nickel	--	--	--	--	Nickel	Body Organs	6.5E-003	--	8.6E-004	7.4E-003		
			Silver	--	--	--	--	Silver	Skin	7.2E-003	--	9.6E-004	8.2E-003		
			Thallium	--	--	--	--	Thallium	Liver/blood	1.7E-002	--	2.3E-003	1.9E-002		
			Vanadium	--	--	--	--	Vanadium	None	1.1E-002	--	1.5E-003	1.3E-002		
			(Total)	1.6E-006	--	1.2E-006	3.0E-006	(Total)		3.7E-001	--	2.0E-001	5.7E-001		
Soil	Subsurface Soil	AOC 1 - HRDD	Aroclor-1248	4.4E-008	--	8.0E-008	1.2E-007	Aroclor-1248	--	--	--	--			
			Aroclor-1254	3.3E-008	--	5.9E-008	9.2E-008	Aroclor-1254	Immune	5.8E-003	--	1.1E-002	1.7E-002		
			Aroclor-1260	1.1E-007	--	1.9E-007	3.0E-007	Aroclor-1260	--	--	--	--			
			Aluminum	--	--	--	--	Aluminum	--	1.3E-002	--	1.7E-003	1.5E-002		
			Antimony	--	--	--	--	Antimony	Whole body/blood	1.5E-002	--	2.0E-003	1.7E-002		
			Arsenic	6.2E-007	--	2.4E-007	8.6E-007	Arsenic	Skin	9.8E-002	--	3.9E-002	1.4E-001		
			Cadmium	--	--	--	--	Cadmium	Kidney	5.3E-003	--	7.0E-005	5.4E-003		
			Copper	--	--	--	--	Copper	--	3.7E-002	--	4.9E-003	4.2E-002		
			Manganese	--	--	--	--	Manganese	--	2.4E-002	--	3.2E-003	2.7E-002		
			Nickel	--	--	--	--	Nickel	Body Organs	1.0E-002	--	1.4E-003	1.1E-002		
			Thallium	--	--	--	--	Thallium	Liver/blood	4.3E-002	--	5.7E-003	4.9E-002		
			Vanadium	--	--	--	--	Vanadium	None	8.6E-003	--	1.1E-003	9.7E-003		
			(Total)	7.8E-007	--	5.2E-007	1.3E-006	(Total)		2.6E-001	--	7.0E-002	3.3E-001		
			Soil	Test Pit Soil	AOC 1 - HRDD	Benzo(a)pyrene	1.7E-007	--	2.8E-007	4.5E-007	Benzo(a)pyrene	--	--	--	--
						Aroclor-1248	1.4E-008	--	2.5E-008	3.9E-008	Aroclor-1248	--	--	--	--
Aroclor-1254	2.1E-007	--				3.8E-007	5.9E-007	Aroclor-1254	Immune	3.7E-001	--	6.9E-001	1.1E+000		
Antimony	--	--				--	--	Antimony	Whole body/blood	3.9E+000	--	5.2E-001	4.4E+000		
Arsenic	1.8E-005	--				7.0E-006	2.5E-005	Arsenic	Skin	2.8E+000	--	1.1E+000	3.9E+000		
(Total)	2.0E-005	--				1.0E-005	3.0E-005	(Total)		7.1E+000	--	2.3E+000	9.5E+000		
Total Risk Across All Media						3.4E-005				Total Hazard Index Across All Media and All Exposure Routes					1.0E+001
Total (Skin) HI =												4.3E+000			
Total (Immune) HI =												1.2E+000			
Total (Whole Body/Blood) HI =												4.4E+000			

TABLE 9.4.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Cardiogenic Risk				Chemical	Non-Cardiogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Test Pit Soil	AOC 1 - HRDD						Benzo(a)pyrene	-	-	-	-	-
								Aroclor-1248	-	-	-	-	-
								Aroclor-1254	Immune	5.6E-002	-	1.2E-001	1.6E-001
								Antimony	Whole body/blood	9.6E-003	-	1.3E-003	1.1E-002
								Arsenic	Skin	1.3E-001	-	5.3E-003	1.4E-001
								(Total)		2.1E-001	-	1.8E-001	3.9E-001

TABLE B.4.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total			
Soil	Surface Soil	AOC 2 - ADC	Benzo(a)anthracene	2.6E-007	--	4.4E-007	7.0E-007	Benzo(a)anthracene	--	--	--	--	--			
			Benzo(b)fluoranthene	3.7E-007	--	6.3E-007	1.0E-006	Benzo(b)fluoranthene	--	--	--	--	--			
			Benzo(a)pyrene	2.5E-008	--	4.2E-008	6.7E-008	Benzo(a)pyrene	--	--	--	--	--			
			Indeno(1,2,3-cd)pyrene	1.5E-007	--	2.5E-007	4.0E-007	Indeno(1,2,3-cd)pyrene	--	--	--	--	--			
			Dibenzo(a,h)anthracene	2.9E-007	--	4.8E-007	7.7E-007	Dibenzo(a,h)anthracene	--	--	--	--	--			
			Aldrin	1.2E-007	--	1.5E-007	2.7E-007	Aldrin	Liver	1.6E-002	--	2.1E-002	3.7E-002			
			Dieldrin	2.0E-007	--	2.6E-007	4.6E-007	Dieldrin	Liver	1.8E-002	--	2.4E-002	4.2E-002			
			Methoxychlor	--	--	--	--	Methoxychlor	Reproductive	2.4E-001	--	4.4E-001	6.8E-001			
			Aroclor-1248	1.2E-008	--	2.1E-008	3.3E-008	Aroclor-1248	--	--	--	--	--			
			Aroclor-1260	8.5E-008	--	1.5E-007	2.4E-007	Aroclor-1260	--	--	--	--	--			
			2,3,7,8-TCDD equiv.	7.9E-007	--	3.0E-007	1.1E-006	2,3,7,8-TCDD equiv.	--	--	--	--	--			
			Antimony	--	--	--	--	Antimony	Whole body/blood	9.8E-002	--	1.3E-002	1.1E-001			
			Arsenic	4.1E-005	--	1.6E-008	4.1E-005	Arsenic	Skin	1.5E+001	--	5.8E+000	2.1E+001			
			(Total)	4.7E-005	--	9.0E-008	5.6E-005	(Total)		1.5E+001	--	6.3E+000	2.1E+001			
Soil	Subsurface Soil	AOC 2 - ADC	1,2-Dichloroethane	6.0E-007	--	7.8E-008	8.4E-008	1,2-Dichloroethane	--	1.6E-002	--	2.1E-001	2.3E-001			
			Benzo(b)fluoranthene	3.9E-008	--	6.6E-008	1.1E-007	Benzo(b)fluoranthene	--	--	--	--	--			
			Benzo(a)pyrene	5.6E-007	--	9.8E-007	1.6E-006	Benzo(a)pyrene	--	--	--	--	--			
			Methoxychlor	--	--	--	--	Methoxychlor	Reproductive	1.8E-001	--	2.4E-001	4.2E-001			
			Aroclor-1242	3.6E-007	--	6.5E-007	1.0E-006	Aroclor-1242	--	--	--	--	--			
			Aroclor-1248	2.5E-008	--	4.6E-008	7.1E-008	Aroclor-1248	--	--	--	--	--			
			Arsenic	2.1E-005	--	8.2E-008	2.9E-005	Arsenic	Skin	3.3E+000	--	1.3E+000	4.6E+000			
			Thallium	--	--	--	--	Thallium	Liver/blood	3.1E-002	--	4.1E-003	3.5E-002			
			(Total)	2.5E-005	--	2.2E-005	4.7E-005	(Total)		3.5E+000	--	1.8E+000	5.3E+000			
			Building Materials	Building Materials	AOC 2 - ADC	Benzo(a)anthracene	1.4E-005	--	2.3E-005	3.7E-005	Benzo(a)anthracene	--	--	--	--	--
Benzo(b)fluoranthene	1.7E-005	--				2.9E-005	4.6E-005	Benzo(b)fluoranthene	--	--	--	--	--			
Benzo(a)pyrene	1.4E-004	--				2.3E-004	3.7E-004	Benzo(a)pyrene	--	--	--	--	--			
Indeno(1,2,3-cd)pyrene	3.7E-006	--				6.3E-006	1.0E-005	Indeno(1,2,3-cd)pyrene	--	--	--	--	--			
Dibenzo(a,h)anthracene	1.1E-005	--				1.9E-005	3.0E-005	Dibenzo(a,h)anthracene	--	--	--	--	--			
Naphthalene	--	--				--	--	Naphthalene	Whole body	1.9E-002	--	2.5E-003	2.2E-002			
2-Methylnaphthalene	--	--				--	--	2-Methylnaphthalene	Whole body	6.6E-002	--	8.6E-003	7.5E-002			
Acenaphthene	--	--				--	--	Acenaphthene	Liver	1.6E-002	--	2.1E-003	1.8E-002			
Dibenzofuran	--	--				--	--	Dibenzofuran	--	3.0E-001	--	3.9E-002	3.4E-001			
Fluorene	--	--				--	--	Fluorene	Blood	4.8E-002	--	6.2E-003	5.4E-002			
Fluoranthene	--	--				--	--	Fluoranthene	Kidney/liver	1.2E-001	--	1.5E-002	1.4E-001			
Pyrene	--	--				--	--	Pyrene	Kidney	1.1E-001	--	1.5E-002	1.3E-001			
Methoxychlor	--	--				--	--	Methoxychlor	Reproductive	3.6E-002	--	3.6E-003	4.0E-002			
Antimony	--	--				--	--	Antimony	Whole body/blood	1.7E-002	--	1.7E-004	1.7E-002			
Arsenic	2.1E-006	--				8.3E-007	2.9E-006	Arsenic	Skin	3.4E-001	--	1.0E-002	3.5E-001			
Copper	--	--				--	--	Copper	--	1.5E-002	--	1.5E-004	1.5E-002			
Manganese	--	--				--	--	Manganese	--	2.5E-002	--	2.5E-004	2.5E-002			
Thallium	--	--				--	--	Thallium	Liver/blood	3.1E-002	--	3.1E-004	3.1E-002			
Zinc	--	--				--	--	Zinc	Blood	1.2E-002	--	1.2E-004	1.2E-002			
(Total)	1.8E-004	--				3.1E-004	4.9E-004	(Total)		1.1E+000	--	1.4E-001	1.3E+000			
Total Risk Across All Media						5.9E-004				Total Hazard Index Across All Media and All Exposure Routes					2.8E+001	

Total [Skin] HI = 2.8E+001  
Total [Kidney] HI = 2.6E+001  
Total [Reproductive] HI = 1.1E+000

TABLE 9.4.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Cardiogenic Risk				Chemical	Non-Cardiogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 2 - ADC						Benzo(a)anthracene	-	-	-	-	-
								Benzo(b)fluoranthene	-	-	-	-	-
								Benzo(a)pyrene	-	-	-	-	-
								Indeno(1,2,3-cd)pyrene	-	-	-	-	-
								Dibenzo(a,h)anthracene	-	-	-	-	-
								Aldrin	Liver	4.6E-003	-	6.1E-003	1.1E-002
								Dieldrin	Liver	4.6E-003	-	6.4E-003	1.1E-002
								Methoxychlor	Reproductive	1.7E-002	-	3.3E-002	5.0E-002
								Aroclor-1248	-	-	-	-	-
								Aroclor-1260	-	-	-	-	-
								2,3,7,8-TCDD equiv.	-	-	-	-	-
								Antimony	Whole body/blood	8.1E-003	-	1.1E-003	9.2E-003
								Arsenic	Skin	1.6E-001	-	7.4E-002	2.5E-001
								(Total)		2.2E-001	-	1.2E-001	3.4E-001
Soil	Subsurface Soil	AOC 2 - ADC						1,2-Dichloroethane	-	1.1E-003	-	1.4E-002	1.5E-002
								Benzo(b)fluoranthene	-	-	-	-	-
								Benzo(a)pyrene	-	-	-	-	-
								Methoxychlor	Reproductive	1.6E-002	-	2.1E-002	3.7E-002
								Aroclor-1242	-	-	-	-	-
								Aroclor-1248	-	-	-	-	-
								Arsenic	Skin	8.4E-002	-	3.4E-002	1.2E-001
								Thallium	Liver/blood	1.7E-002	-	2.3E-003	1.7E-002
								(Total)		1.2E-001	-	7.1E-002	1.6E-001
Building Materials	Building Materials	AOC 2 - ADC	Benzo(a)anthracene	5.8E-006	-	9.8E-006	1.6E-005	Benzo(a)anthracene	-	-	-	-	-
			Benzo(b)fluoranthene	6.7E-006	-	1.1E-005	1.8E-005	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	5.3E-005	-	8.9E-005	1.4E-004	Benzo(a)pyrene	-	-	-	-	-
			Indeno(1,2,3-cd)pyrene	1.8E-006	-	3.1E-005	3.3E-005	Indeno(1,2,3-cd)pyrene	-	-	-	-	-
			Dibenzo(a,h)anthracene	5.3E-006	-	8.9E-006	1.4E-005	Dibenzo(a,h)anthracene	-	-	-	-	-
			Naphthalene	-	-	-	-	Naphthalene	Whole body	6.1E-003	-	7.9E-004	6.9E-003
			2-Methylnaphthalene	-	-	-	-	2-Methylnaphthalene	Whole body	3.0E-002	-	3.9E-003	3.4E-002
			Acenaphthene	-	-	-	-	Acenaphthene	Liver	7.1E-003	-	9.3E-004	8.0E-003
			Dibenzofuran	-	-	-	-	Dibenzofuran	-	1.2E-001	-	1.6E-002	1.4E-001
			Fluorene	-	-	-	-	Fluorene	Blood	1.8E-002	-	2.3E-003	2.0E-002
			Fluoranthene	-	-	-	-	Fluoranthene	Kidney/liver	5.5E-002	-	7.2E-003	6.2E-002
			Pyrene	-	-	-	-	Pyrene	Kidney	5.6E-002	-	7.3E-003	6.3E-002
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	9.1E-003	-	9.1E-004	1.0E-002
			Antimony	-	-	-	-	Antimony	Whole body/blood	1.1E-002	-	1.1E-004	1.1E-002
			Arsenic	1.2E-006	-	4.6E-007	1.7E-006	Arsenic	Skin	1.8E-001	-	5.5E-003	1.9E-001
			Copper	-	-	-	-	Copper	-	7.6E-003	-	7.8E-005	7.7E-003
			Manganese	-	-	-	-	Manganese	-	1.2E-002	-	1.2E-004	1.2E-002
			Thallium	-	-	-	-	Thallium	Liver/blood	1.5E-002	-	1.5E-004	1.5E-002
			Zinc	-	-	-	-	Zinc	Blood	3.8E-003	-	3.9E-005	3.9E-003
			(Total)	7.4E-005	-	1.2E-004	2.0E-004	(Total)		5.3E-001	-	4.5E-002	5.6E-001

TABLE 9.4.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 3 - SPD	Benzo(a)anthracene	2.1E-008	-	3.8E-008	5.7E-008	Benzo(a)anthracene	-	-	-	-	-
			Benzo(b)fluoranthene	3.6E-008	-	8.0E-008	9.8E-008	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	1.8E-007	-	3.1E-007	4.9E-007	Benzo(a)pyrene	-	-	-	-	-
			Indeno(1,2,3-cd)pyrene	1.8E-008	-	2.7E-008	4.3E-008	Indeno(1,2,3-cd)pyrene	-	-	-	-	-
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	1.8E-001	-	2.1E-001	3.7E-001
			Aluminum	-	-	-	-	Aluminum	-	1.0E-002	-	1.3E-003	1.1E-002
			Antimony	-	-	-	-	Antimony	Whole body/blood	5.1E-002	-	8.8E-003	5.8E-002
			Arsenic	8.1E-007	-	2.4E-007	8.5E-007	Arsenic	Skin	9.8E-002	-	3.8E-002	1.3E-001
			Copper	-	-	-	-	Copper	-	4.8E-002	-	6.1E-003	5.2E-002
			Manganese	-	-	-	-	Manganese	-	1.1E-002	-	1.4E-003	1.2E-002
			Thallium	-	-	-	-	Thallium	Liver/blood	1.8E-002	-	2.1E-003	1.8E-002
			Vanadium	-	-	-	-	Vanadium	None	8.3E-003	-	8.5E-004	7.2E-003
			(Total)	8.7E-007	-	8.7E-007	1.5E-006	(Total)		3.9E-001	-	2.7E-001	6.6E-001
Soil	Subsurface Soil	AOC 3 - SPD	Benzo(a)pyrene	1.2E-008	-	1.9E-008	3.1E-008	Benzo(a)pyrene	-	-	-	-	-
			Aroclor-1254	5.8E-009	-	1.0E-008	1.8E-008	Aroclor-1254	Immune	9.8E-003	-	1.8E-002	2.8E-002
			Aroclor-1260	8.0E-009	-	1.1E-008	1.7E-008	Aroclor-1260	-	-	-	-	-
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	4.3E-003	-	5.8E-003	1.0E-002
			Aluminum	-	-	-	-	Aluminum	-	1.1E-002	-	1.5E-003	1.3E-002
			Antimony	-	-	-	-	Antimony	Whole body/blood	2.5E-003	-	3.3E-004	2.8E-003
			Arsenic	7.4E-007	-	2.9E-007	1.0E-006	Arsenic	Skin	1.2E-001	-	4.6E-002	1.7E-001
			Cadmium	-	-	-	-	Cadmium	Kidney	8.0E-004	-	1.1E-005	8.1E-004
			Manganese	-	-	-	-	Manganese	-	9.8E-003	-	1.3E-003	1.1E-002
			Thallium	-	-	-	-	Thallium	Liver/blood	2.1E-002	-	2.7E-003	2.4E-002
			Vanadium	-	-	-	-	Vanadium	None	5.7E-003	-	7.5E-004	-
			(Total)	7.6E-007	-	3.3E-007	1.1E-006	(Total)		1.8E-001	-	7.7E-002	2.6E-001
Soil	Test Pit Soil	AOC 3 - SPD	Hexachloroethane	2.4E-006	-	3.1E-006	5.5E-006	Hexachloroethane	Kidney	1.2E+001	-	1.8E+001	2.8E+001
			Benzo(a)pyrene	5.8E-007	-	9.8E-007	1.6E-006	Benzo(a)pyrene	-	-	-	-	-
			Dibenzo(a,h)anthracene	1.1E-007	-	1.8E-007	1.1E-007	Dibenzo(a,h)anthracene	-	-	-	-	-
			Aroclor-1248	7.1E-007	-	1.30E-006	2.0E-006	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	2.0E-007	-	3.70E-007	5.7E-007	Aroclor-1254	Immune	3.8E-001	-	8.7E-001	1.0E+000
			Arsenic	2.0E-006	-	7.60E-007	2.8E-006	Arsenic	Skin	3.1E-001	-	1.2E-001	4.3E-001
			Copper	-	-	-	-	Copper	-	9.7E-001	-	1.3E-001	1.1E+000
			(Total)	8.0E-006	-	8.7E-006	1.3E-005	(Total)		1.4E+001	-	1.7E+001	3.1E+001
			Total Risk Across Media	1.5E-005				Total Hazard Index Across All Media and All Exposure Routes	3.1E+001				

Total [Kidney] HI = 2.8E+001  
Total [Skin] HI = 7.3E-001  
Total [Immune] HI = 1.1E+000



TABLE 9.4.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Test Pit Soil	AOC 3 - SPD						Hexachloroethane	Kidney	2.1E-003	-	2.8E-003	4.9E-003
								Benzo(a)pyrene	-	-	-	-	-
								Dibenzo(a,h)anthracene	-	-	-	-	-
								Aroclor-1248	-	-	-	-	-
								Aroclor-1254	Immune	4.8E-002	-	8.8E-002	1.3E-001
								Arsenic	Skin	8.8E-002	-	3.4E-002	1.2E-001
								Copper	-	1.1E-001	-	1.4E-002	1.2E-001
								(Total)	-	2.4E-001	-	1.4E-001	3.8E-001

TABLE 9.4.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 4 - ARC	Benzo(b)fluoranthene	3.2E-008	-	5.4E-008	8.6E-008	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	2.2E-007	-	3.8E-007	6.0E-007	Benzo(a)pyrene	-	-	-	-	-
			Hexachlorobutadiene	9.0E-009	-	1.2E-008	2.1E-008	Hexachlorobutadiene	Kidney	4.1E-002	-	5.4E-002	9.5E-002
			Hexachlorocyclopentadiene	-	-	-	-	Hexachlorocyclopentadiene	Stomach	9.8E-003	-	1.3E-002	2.3E-002
			Aldrin	8.4E-008	-	8.2E-008	1.5E-008	Aldrin	Liver	8.8E-004	-	1.2E-003	2.1E-003
			Aroclor-1248	3.0E-008	-	5.5E-008	8.5E-008	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	8.8E-008	-	1.2E-007	1.9E-007	Aroclor-1254	Immune	1.2E-001	-	2.2E-001	3.4E-001
			Aroclor-1260	1.6E-008	-	2.9E-008	4.5E-008	Aroclor-1260	-	-	-	-	-
			2,3,7,8-TCDD equiv.	5.1E-007	-	2.0E-007	7.1E-007	2,3,7,8-TCDD equiv.	-	-	-	-	-
			Aluminum	-	-	-	-	Aluminum	-	1.9E-002	-	2.8E-003	2.2E-002
			Antimony	-	-	-	-	Antimony	Whole body/blood	5.4E-002	-	7.2E-003	6.1E-002
			Arsenic	6.9E-007	-	2.7E-007	9.6E-007	Arsenic	Skin	1.1E-001	-	4.3E-002	1.5E-001
			Cadmium	-	-	-	-	Cadmium	Kidney	4.4E-002	-	5.9E-004	4.6E-002
			Copper	-	-	-	-	Copper	-	1.8E-002	-	2.4E-003	2.0E-002
			Manganese	-	-	-	-	Manganese	-	2.3E-002	-	3.1E-003	2.6E-002
			Nickel	-	-	-	-	Nickel	Body organs	1.8E-002	-	2.4E-003	2.0E-002
			Silver	-	-	-	-	Silver	Skin	6.9E-002	-	9.2E-003	7.8E-002
			Thallium	-	-	-	-	Thallium	Liver/blood	1.2E-002	-	1.8E-003	1.4E-002
			Zinc	-	-	-	-	Zinc	Blood	3.7E-002	-	4.9E-003	4.2E-002
			(Total)	1.6E-008	-	1.1E-008	2.7E-008	(Total)	(Total)	6.7E-001	-	3.6E-001	9.3E-001
Soil	Subsurface Soil	AOC 4 - ARC	Tetrachloroethene	1.7E-008	-	2.2E-007	2.4E-007	Tetrachloroethene	Liver	2.3E-003	-	3.1E-002	3.3E-002
			Chlorobenzene	-	-	-	-	Chlorobenzene	Liver	1.8E-003	-	2.4E-002	2.6E-002
			Benzo(a)anthracene	9.8E-009	-	1.7E-008	2.7E-008	Benzo(a)anthracene	-	-	-	-	-
			Benzo(b)fluoranthene	1.0E-008	-	1.7E-008	2.7E-008	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	9.5E-008	-	1.6E-007	2.6E-007	Benzo(a)pyrene	-	-	-	-	-
			Indeno(1,2,3-cd)pyrene	6.6E-009	-	1.4E-008	2.3E-008	Indeno(1,2,3-cd)pyrene	-	-	-	-	-
			1,2,4-Trichlorobenzene	-	-	-	-	1,2,4-Trichlorobenzene	Adrenal	1.4E-002	-	1.8E-002	3.2E-002
			Aldrin	1.6E-008	-	2.1E-008	3.7E-008	Aldrin	Liver	2.3E-004	-	3.0E-004	5.3E-004
			Aroclor-1248	5.1E-009	-	9.2E-009	1.4E-008	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	1.9E-009	-	3.4E-009	5.3E-009	Aroclor-1254	Immune	3.4E-003	-	6.3E-003	9.7E-003
			Aluminum	-	-	-	-	Aluminum	-	1.6E-002	-	2.1E-003	1.8E-002
			Antimony	-	-	-	-	Antimony	Whole body/blood	6.3E-003	-	8.4E-004	7.1E-003
			Arsenic	3.3E-007	-	1.3E-007	4.6E-007	Arsenic	Skin	5.2E-002	-	2.1E-002	7.3E-002
			Manganese	-	-	-	-	Manganese	-	6.7E-003	-	8.9E-004	7.6E-003
			Thallium	-	-	-	-	Thallium	Liver/blood	1.9E-002	-	2.5E-003	2.2E-002
			Vanadium	-	-	-	-	Vanadium	None	7.4E-003	-	9.8E-004	8.4E-003
			(Total)	4.8E-007	-	5.7E-007	1.1E-006	(Total)	(Total)	1.3E-001	-	1.1E-001	2.4E-001
Building Materials	Building Materials	AOC 4 - ARC	Aroclor-1254	1.0E-008	-	1.8E-008	2.8E-008	Aroclor-1254	Immune	1.8E+000	-	3.4E+000	5.2E+000
			2,3,7,8-TCDD equiv.	4.3E-005	-	1.7E-005	6.0E-005	2,3,7,8-TCDD equiv.	-	-	-	-	-
			Antimony	-	-	-	-	Antimony	Whole body/blood	9.5E+001	-	1.3E+001	1.1E+002
			Arsenic	6.5E-008	-	2.5E-008	9.0E-008	Arsenic	Skin	1.0E+000	-	4.1E+001	1.4E+000
			(Total)	5.1E-005	-	2.1E-005	7.2E-005	(Total)	(Total)	9.8E+001	-	1.6E+001	1.1E+002

Total Risk Across Media  
Total Risk Across All Media and All Exposure Routes 7.6E-005

Total Hazard Index Across All Media and All Exposure Routes

Total [Skin] HI = 1.7E+000  
Total [Whole Body/blood] HI = 1.1E+002  
Total [Immune] HI = 5.5E+000

TABLE 9.4.CT  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Building Materials	Building Materials	AOC 4 - ARC						Aroclor-1254	Immune	3.4E-001	-	6.3E-001	9.7E-001
								2,3,7,8-TCDD equiv.	-	-	-	-	-
								Antimony	Whole body/blood	2.7E+001	-	3.8E+000	3.1E+001
								Arsenic	Skin	6.2E-001	-	2.5E-001	6.7E-001
									(Total)	2.8E+001	-	4.5E+000	3.2E+001

TABLE 10.1.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 2 - ADC	Arsenic	1.2E-005	—	9.5E-006	2.2E-005	Arsenic	Skin	7.3E-001	—	5.5E-001	1.3E+000
			(Total)	1.2E-005	—	9.5E-006	2.2E-005	(Total)		7.3E-001	—	5.5E-001	1.3E+000
Building Materials	Building Materials	AOC 2 - ADC	Benzo(a)anthracene	4.1E-006	—	1.4E-005	1.8E-005	Benzo(a)anthracene	--	—	—	—	—
			Benzo(b)fluoranthene	5.2E-006	—	1.7E-005	2.2E-005	Benzo(b)fluoranthene	--	—	—	—	—
			Benzo(a)pyrene	4.1E-005	—	1.4E-004	1.8E-004	Benzo(a)pyrene	--	—	—	—	—
			Indeno(1,2,3-cd)pyrene	1.1E-006	—	3.7E-006	4.8E-006	Indeno(1,2,3-cd)pyrene	--	—	—	—	—
			Dibenzo(a,h)anthracene	3.4E-006	—	1.1E-005	1.4E-005	Dibenzo(a,h)anthracene	--	—	—	—	—
			Arsenic	6.4E-007	—	4.9E-007	1.1E-006	Arsenic	Skin	1.7E-002	—	1.3E-002	3.0E-002
			(Total)	5.5E-005	—	1.9E-004	2.4E-004	(Total)		1.7E-002	—	1.3E-002	3.0E-002
Surface Water	Surface Water	AOC 2 - ADC	Arsenic	1.8E-006	—	3.3E-008	1.8E-006	Arsenic	Skin	4.7E-002	—	8.6E-004	4.8E-002
			(Total)	1.8E-006	—	3.3E-008	1.8E-006	(Total)		4.7E-002	—	8.6E-004	4.8E-002
Sediment	Sediment	AOC 2 - ADC	Benzo(a)pyrene	4.4E-007	—	5.4E-007	9.8E-007	Benzo(a)pyrene	--	—	—	—	—
			Arsenic	5.2E-005	—	1.5E-005	6.7E-005	Arsenic	Skin	1.4E+000	—	3.8E-001	1.8E+000
			(Total)	5.3E-005	—	1.6E-005	6.8E-005	(Total)		1.4E+000	—	3.8E-001	1.8E+000
Total Risk Across Media				Total Hazard Index Across All Media and All Exposure Routes				Total [Skin] HI =					
Total Risk Across All Media and All Exposure Routes				3.3E-004				3.1E+000					

TABLE 10.1.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents (Trespassers)  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 4 - ARC	2,3,7,8-TCDD equiv.	1.5E-007	—	1.2E-007	2.7E-007	Aroclor-1254 Antimony	Immune Whole body/blood (Total)	5.8E-003	—	2.0E-002	2.6E-002
			Aroclor-1254	2.0E-008	—	7.1E-008	9.1E-008			2.7E-003	—	6.8E-004	3.4E-003
			Antimony	—	—	—	—			8.5E-003	—	2.1E-002	2.9E-002
			(Total)	1.7E-007	—	1.9E-007	3.6E-007			—	—	—	—
Building Materials	Building Materials	AOC 4 - ARC	Aroclor-1254	3.1E-007	—	1.1E-006	1.4E-006	Aroclor-1254 Antimony	Immune Whole body/blood (Total)	9.0E-002	—	3.2E-001	4.1E-001
			2,3,7,8-TCDD equiv.	1.3E-005	—	1.2E-007	1.3E-005			4.8E+000	—	1.2E+000	6.0E+000
			Antimony	—	—	—	—			4.9E+000	—	1.5E+000	6.4E+000
			(Total)	1.3E-005	—	1.2E-006	1.5E-005			—	—	—	—
Surface Water	Surface Water	AOC 4 - ARC	Antimony	—	—	—	—	Antimony (Total)	Whole body/blood (Total)	6.9E-003	—	1.3E-004	7.0E-003
			(Total)	—	—	—	—			6.9E-003	—	1.3E-004	7.0E-003
Sediment	Sediment	AOC 4 - ARC	Aroclor-1254	1.2E-006	—	1.5E-006	2.7E-006	Aroclor-1254 Antimony (Total)	Immune Whole body/blood (Total)	3.5E-001	—	4.4E-001	7.9E-001
			2,3,7,8-TCDD equiv.	1.2E-007	—	3.4E-008	1.5E-007			7.8E-003	—	7.2E-004	8.5E-003
			Antimony	—	—	—	—			3.6E-001	—	4.4E-001	8.0E-001
			(Total)	1.3E-006	—	1.5E-006	2.9E-006			—	—	—	—
Total Risk Across (Media)								Total Hazard Index Across All Media and All Exposure Routes					7.2E+000
Total Risk Across All Media and All Exposure Routes							1.8E-005						
												Total [Whole Body/blood] HI =	6.0E+000
												Total [Immune] HI =	1.2E+000

TABLE 10.1.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
RISK ASSESSMENT SUMMARY  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure		Primary	Ingestion	Inhalation	Dermal	Exposure		
Surface Water	Surface Water	AOC 5 - DSM	Arsenic	2.2E-006	—	4.0E-008	2.3E-006	Arsenic	Skin	5.7E-002	—	1.0E-003	5.8E-002		
			(Total)	2.2E-006	—	4.0E-008	2.3E-006	(Total)		5.7E-002	—	1.0E-003	5.9E-002		
Sediment	Sediment	AOC 5 - DSM	Arsenic	6.0E-005	—	1.7E-005	7.7E-005	Arsenic	Skin	1.6E+000	—	4.4E-001	2.0E+000		
			(Total)	6.0E-005	—	1.7E-005	7.7E-005	(Total)		1.6E+000	—	4.4E-001	2.1E+000		
				Total Risk Across [Media]								Total Hazard Index Across All Media and All Exposure Routes		2.1E+000	
				Total Risk Across All Media and All Exposure Routes				7.9E-005				Total [Skin] HI = 2.1E+000			

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TABLE 10.1.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Area Residents  
Receptor Age: Youth (12-17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	AOC 6 - RR	Arsenic	7.8E-008	—	1.4E-009	7.9E-008	Arsenic	Skin	2.0E-003	—	3.7E-005	2.0E-003
			(Total)	7.8E-008	—	1.4E-009	7.9E-008	(Total)		5.0E-003	—	9.2E-005	5.1E-003
Sediment	Sediment	AOC 6 - RR	Arsenic	3.3E-005	—	9.3E-006	4.2E-005	Arsenic	Skin	8.8E-001	—	2.4E-001	1.1E+000
			(Total)	3.3E-005	—	9.3E-006	4.2E-005	(Total)		8.8E-001	—	2.4E-001	1.1E+000
				Total Risk Across (Media)				Total Hazard Index Across All Media and All Exposure Routes					
				Total Risk Across All Media and All Exposure Routes				1.1E+000					

TABLE 10.2a.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Residents  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary	Non-Carcinogenic Hazard Quotient			
				Ingestion	Inhalation	Dermal	Exposure			Ingestion	Inhalation	Dermal	Exposure
Surface Water	Shellfish	AOC 5 - DSM	Arsenic	1.2E-008	--	--	1.2E-008	Arsenic	Skin	7.4E-008	--	--	7.4E-008
			(Total)	1.2E-008	--	--	1.2E-008	(Total)		7.4E-008	--	--	7.4E-008
Surface Water	Surface Water	AOC 5 - DSM	Arsenic	3.5E-005	--	1.6E-005	5.1E-005	Arsenic	Skin	2.3E-001	--	1.1E-001	3.4E-001
			(Total)	3.5E-005	--	1.6E-005	5.1E-005	(Total)		2.3E-001	--	1.1E-001	3.4E-001
Sediment	Sediment	AOC 5 - DSM	Arsenic	1.9E-004	--	1.5E-004	3.4E-004	Arsenic	Skin	1.3E+000	--	9.7E-001	2.2E+000
			(Total)	1.9E-004	--	1.5E-004	3.4E-004	(Total)		1.3E+000	--	9.7E-001	2.2E+000
Total Risk Across[Media]								Total Hazard Index Across All Media and All Exposure Routes				2.6E+000	
Total Risk Across All Media and All Exposure Routes				3.9E-004									

Total [Skin] HI = 2.6E+000



TABLE 10.2a.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Current and Future  
Receptor Population: Residents  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Shellfish	AOC 6 - RR	Arsenic	4.1E-010	--	--	4.1E-010	Arsenic	Skin	2.6E-007	--	--	2.6E-007
			(Total)	4.1E-010	--	--	4.1E-010			2.6E-007	--	--	2.6E-007
Surface Water	Surface Water	AOC 6 - RR	Arsenic	1.2E-006	--	5.7E-007	1.8E-006	Arsenic	Skin	8.0E-003	--	3.7E-003	1.2E-002
			(Total)	1.2E-006	--	5.7E-007	1.8E-006			8.0E-003	--	3.7E-003	1.2E-002
Sediment	Sediment	AOC 6 - RR	Arsenic	1.1E-004	--	8.0E-005	1.9E-004	Arsenic	Skin	6.9E-001	--	5.3E-001	1.2E+000
			(Total)	1.1E-004	--	8.0E-005	1.9E-004			6.9E-001	--	5.3E-001	1.2E+000
Total Risk Across[Media]								Total Hazard Index Across All Media and All Exposure Routes					1.2E+000
Total Risk Across All Media and All Exposure Routes				1.9E-004									

Total [Skin] HI = 1.2E+000

TABLE 10.2b.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Residents  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure		Primary	Ingestion	Inhalation	Dermal	Exposure
Surface Water	Surface Water	AOC 5 - DSM	Arsenic	4.2E-005	--	6.7E-006	4.8E-005	Arsenic	Skin	1.1E+000	--	1.7E-001	1.3E+000
			(Total)	4.2E-005	--	6.7E-006	4.8E-005	(Total)		1.1E+000	--	1.7E-001	1.3E+000
Sediment	Sediment	AOC 5 - DSM	Arsenic	4.5E-004	--	1.1E-004	5.6E-004	Arsenic	Skin	1.2E+001	--	2.8E+000	1.5E+001
			(Total)	4.5E-004	--	1.1E-004	5.6E-004	(Total)		1.2E+001	--	2.8E+000	1.5E+001
Total Risk Across[Media]								Total Hazard Index Across All Media and All Exposure Routes					1.6E+001
Total Risk Across All Media and All Exposure Routes				6.1E-004									

Total [Skin] HI = 1.6E+001

400415

TABLE 10.2b.CT  
RISK ASSESSMENT SUMMARY  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Residents  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	AOC 5 - DSM	Arsenic (Total)	2.2E-004	-	5.2E-005	2.7E-004	Arsenic (Total)	Skin	5.6E+000	-	1.3E+000	6.9E+000
				2.2E-004	-	5.2E-005	2.7E-004			5.6E+000	-	1.3E+000	6.9E+000

TABLE 10.2b.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE

Receptor Population: Residents  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	AOC 6 - RR	Arsenic	1.2E-006	--	5.7E-007	1.8E-006	Arsenic	Skin	8.0E-003	--	3.7E-003	1.2E-002
			(Total)	1.2E-006	--	5.7E-007	1.8E-006	(Total)		8.0E-003	--	3.7E-003	1.2E-002
Sediment	Sediment	AOC 6 - RR	Arsenic	2.5E-004	--	5.9E-005	3.1E-004	Arsenic	Skin	6.5E+000	--	1.5E+000	8.0E+000
			(Total)	2.5E-004	--	5.9E-005	3.1E-004	(Total)		6.5E+000	--	1.5E+000	8.0E+000
Total Risk Across Media							3.1E-004	Total Hazard Index Across All Media and All Exposure Routes					8.0E+000
Total Risk Across All Media and All Exposure Routes							3.1E-004	Total [Skin] HI =					8.0E+000

TABLE 10.2b.CT  
 RISK ASSESSMENT SUMMARY  
 CENTRAL TENDENCY EXPOSURE  
 HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
 Receptor Population: Residents  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	AOC 6 - RR						Arsenic	Skin	1.3E+000	—	3.2E-001	1.7E+000
								(Total)		1.3E+000	—	3.3E-001	1.7E+000

TABLE 10.3.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 1 - HRDD	Aroclor-1248	3.4E-008	-	5.3E-005	5.6E-005	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	3.1E-007	-	4.8E-006	5.1E-006	Aroclor-1254	Immune	2.1E-002	-	3.4E-001	3.6E-001
			Aroclor-1260	2.6E-007	-	4.0E-006	4.3E-006	Aroclor-1260	-	-	-	-	-
			Arsenic	1.4E-005	-	4.8E-005	6.2E-005	Arsenic	Skin	8.7E-002	-	3.0E-001	3.9E-001
			(Total)	1.8E-005	-	1.1E-004	1.3E-004	(Total)		1.1E-001	-	6.4E-001	7.5E-001
Soil	Subsurface Soil	AOC 1 - HRDD	Aroclor-1248	4.7E-007	-	7.3E-006	7.8E-006	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	3.5E-008	-	5.4E-007	5.8E-007	Aroclor-1254	Immune	2.4E-003	-	3.8E-002	4.0E-002
			Aroclor-1260	1.1E-008	-	1.7E-005	1.8E-005	Aroclor-1260	-	-	-	-	-
			Arsenic	6.6E-008	-	2.2E-005	2.9E-005	Arsenic	Skin	4.0E-002	-	1.4E-001	1.8E-001
			(Total)	8.2E-008	-	4.7E-005	5.5E-005	(Total)		4.2E-002	-	1.8E-001	2.2E-001
Soil	Test Pit Soil	AOC 1 - HRDD	Aroclor-1248	1.5E-005	-	2.3E-004	2.5E-004	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	2.2E-006	-	3.5E-005	3.7E-005	Aroclor-1254	Immune	1.5E-001	-	2.5E+000	2.7E+000
			Antimony	-	-	-	-	Antimony	Whole body/blood	1.6E+000	-	1.9E+000	3.5E+000
			Arsenic	1.9E-004	-	6.4E-004	8.3E-004	Arsenic	Skin	1.2E+000	-	4.0E+000	5.2E+000
			(Total)	2.1E-004	-	9.1E-004	1.1E-003	(Total)		2.9E+000	-	8.4E+000	1.1E+001
Total Risk Across Media							Total Hazard Index Across All Media and All Exposure Routes						
Total Risk Across All Media and All Exposure Routes							1.3E-003						
							1.2E+001						

Total [Skin] HI = 5.8E+000  
Total [Immune] HI = 3.1E+000  
Total (Whole Body/Blood) HI = 3.5E+000

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TABLE 10.3.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 2 - ADC	Benzo(a)anthracene	2.8E-007	-	4.0E-005	4.0E-005	Benzo(a)anthracene	-	-	-	-	-
			Benzo(b)fluoranthene	3.9E-006	-	5.7E-005	6.1E-005	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	2.6E-005	-	3.8E-004	4.1E-004	Benzo(a)pyrene	-	-	-	-	-
			Indeno(1,2,3-cd)pyrene	1.6E-006	-	2.3E-005	2.5E-005	Indeno(1,2,3-cd)pyrene	-	-	-	-	-
			Dibenzo(a,h)anthracene	3.0E-006	-	4.4E-005	4.7E-005	Dibenzo(a,h)anthracene	-	-	-	-	-
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	9.8E-002	-	1.1E+000	1.2E+000
			Aroclor-1248	1.2E-005	-	1.9E-004	2.0E-004	Aroclor-1248	-	-	-	-	-
			Aroclor-1260	9.0E-007	-	1.4E-005	1.5E-005	Aroclor-1260	-	-	-	-	-
			Arsenic	4.4E-004	-	1.5E-006	4.4E-004	Arsenic	Skin	5.9E+000	-	2.1E+001	2.7E+001
			(Total)	4.9E-004	-	7.5E-004	1.2E-003	(Total)	-	6.0E+000	-	2.2E+001	2.8E+001
			1,2-Dichloroethane	6.4E-006	-	7.1E-004	7.2E-004	1,2-Dichloroethane	-	6.4E-003	-	7.4E-001	7.5E-001
			Benzo(b)fluoranthene	4.1E-007	-	6.0E-006	6.4E-006	Benzo(b)fluoranthene	-	-	-	-	-
Soil	Subsurface Soil	AOC 2 - ADC	Benzo(a)pyrene	6.2E-006	-	8.9E-005	9.5E-005	Benzo(a)pyrene	-	-	-	-	-
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	7.4E-002	-	8.7E-001	9.4E-001
			Aroclor-1242	3.8E-006	-	5.9E-005	6.3E-005	Aroclor-1242	-	-	-	-	-
			Aroclor-1248	2.7E-005	-	4.1E-004	4.4E-004	Aroclor-1248	-	-	-	-	-
			Arsenic	2.2E-004	-	7.5E-004	9.7E-004	Arsenic	Skin	1.4E+000	-	4.7E+000	6.1E+000
			(Total)	2.6E-004	-	2.0E-003	2.3E-003	(Total)	-	1.4E+000	-	4.8E+000	7.8E+000
Building Materials	Building Materials	AOC 2 - ADC	Benzo(a)anthracene	1.4E-004	-	2.1E-003	2.2E-003	Benzo(a)anthracene	-	-	-	-	-
			Benzo(b)fluoranthene	1.8E-004	-	2.7E-003	2.9E-003	Benzo(b)fluoranthene	-	-	-	-	-
			Benzo(a)pyrene	1.4E-003	-	2.1E-002	2.2E-002	Benzo(a)pyrene	-	-	-	-	-
			Indeno(1,2,3-cd)pyrene	3.9E-005	-	5.7E-004	6.1E-004	Indeno(1,2,3-cd)pyrene	-	-	-	-	-
			Dibenzo(a,h)anthracene	1.2E-004	-	1.7E-003	1.8E-003	Dibenzo(a,h)anthracene	-	-	-	-	-
			Fluoranthene	-	-	-	-	Fluoranthene	Kidney/liver	4.8E-002	-	7.2E-001	7.7E-001
			Pyrene	-	-	-	-	Pyrene	Kidney	4.8E-002	-	6.9E-001	7.4E-001
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	1.5E-002	-	1.7E-001	1.9E-001
			Arsenic	2.3E-005	-	7.6E-005	9.9E-005	Arsenic	Skin	1.4E-001	-	4.8E-001	6.2E-001
			(Total)	1.9E-003	-	2.8E-002	3.0E-002	(Total)	-	2.2E-001	-	1.7E+000	1.9E+000
			Total Risk Across All Media and All Exposure Routes	3.4E-002				Total Hazard Index Across All Media and All Exposure Routes	3.8E+001				

Total [Skin] HI = 3.4E+001  
Total [Kidney] HI = 1.5E+000  
Total [Reproductive] HI = 2.3E+000

TABLE 10.3.CT  
RISK ASSESSMENT SUMMARY  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Building Materials	Building Materials	AOC 2 - ADC	Benzo(a)anthracene	7.9E-006	-	2.1E-004	2.1E-004						
			Benzo(b)fluoranthene	9.1E-006	-	2.4E-004	2.4E-004						
			Benzo(a)pyrene	7.2E-005	-	1.9E-003	1.9E-003						
			Indeno(1,2,3-cd)pyrene	2.5E-006	-	6.6E-005	6.6E-005						
			Dibenzo(a,h)anthracene	7.1E-006	-	1.9E-004	2.0E-004						
			Fluoranthene	-	-	-	-						
			Pyrene	-	-	-	-						
			Methoxychlor	-	-	-	-						
			Arsenic	1.6E-006	-	9.7E-005	9.9E-005						
			(Total)	1.0E-004	-	2.6E-003	2.7E-003						

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TABLE 10.3.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil	Surface Soil	AOC 3 - SPD	Benzo(a)anthracene	2.2E-007	--	3.2E-008	3.4E-008	Benzo(a)anthracene	--	--	--	--	--	
			Benzo(b)fluoranthene	3.8E-007	--	5.5E-008	5.9E-008	Benzo(b)fluoranthene	--	--	--	--	--	
			Benzo(a)pyrene	1.9E-008	--	2.8E-005	3.0E-005	Benzo(a)pyrene	--	--	--	--	--	
			Indeno(1,2,3-cd)pyrene	1.7E-007	--	2.5E-008	2.7E-008	Indeno(1,2,3-cd)pyrene	--	--	--	--	--	
			Arsenic	6.5E-008	--	2.2E-005	2.9E-005	Arsenic	Skin	3.9E-002	--	1.4E-001	1.8E-001	
			(Total)	9.2E-008	--	6.1E-005	7.0E-005	(Total)		3.9E-002	--	1.4E-001	1.8E-001	
Soil	Subsurface Soil	AOC 3 - SPD	Benzo(a)pyrene	1.2E-007	--	1.8E-008	1.9E-008	Benzo(a)pyrene	--	--	--	--	--	
			Aroclor-1254	5.9E-008	--	9.2E-007	9.8E-007	Aroclor-1254	Immune	4.0E-003	--	6.5E-002	6.9E-002	
			Aroclor-1260	6.3E-008	--	9.9E-007	1.1E-006	Aroclor-1260	--	--	--	--	--	
			Arsenic	7.8E-008	--	2.6E-005	3.4E-005	Arsenic	Skin	4.7E-002	--	1.7E-001	2.2E-001	
			(Total)	8.0E-008	--	3.0E-005	3.8E-005	(Total)		5.1E-002	--	2.4E-001	2.9E-001	
			Soil	Test Pit Soil	AOC 3 - SPD	Hexachloroethane	2.8E-005	--	2.9E-004	3.2E-004	Hexachloroethane	Kidney	5.0E+000	--
Benzo(a)pyrene	6.2E-008	--				8.9E-005	9.5E-005	Benzo(a)pyrene	--	--	--	--	--	
Dibenzo(a,h)anthracene	1.2E-008	--				1.7E-005	1.2E-008	Dibenzo(a,h)anthracene	--	--	--	--	--	
Aroclor-1248	7.6E-008	--				1.2E-004	1.3E-004	Aroclor-1248	--	--	--	--	--	
Aroclor-1254	2.2E-008	--				3.4E-005	3.6E-005	Aroclor-1254	Immune	1.5E-001	--	2.4E+000	2.6E+000	
Arsenic	2.1E-005	--				6.9E-005	9.0E-005	Arsenic	Skin	1.3E-001	--	4.4E-001	5.7E-001	
(Total)	6.4E-005	--				6.2E-004	6.8E-004	(Total)		5.3E+000	--	6.1E+001	6.6E+001	
Total Risk Across[Media]						Total Hazard Index Across All Media and All Exposure Routes				6.7E+001				
Total Risk Across All Media and All Exposure Routes						7.9E-004								

Total [Skin] HI = 9.7E-001  
Total [Kidney] HI = 6.3E+001  
Total [Immune] HI = 2.6E+000

TABLE 10.3.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 4 - ARC	Aroclor-1248	3.2E-007	-	5.0E-008	5.3E-008	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	7.0E-007	-	1.1E-005	1.2E-005	Aroclor-1254	Immune	4.8E-002	-	7.7E-001	8.2E-001
			Aroclor-1280	1.7E-007	-	2.6E-008	2.8E-008	Aroclor-1280	-	-	-	-	-
			Antimony	-	-	-	-	Antimony	Whole body/blood	2.2E-002	-	2.6E-002	4.8E-002
			Arsenic	7.3E-008	-	2.4E-005	3.1E-005	Arsenic	Skin	4.4E-002	-	1.5E-001	1.9E-001
			(Total)	8.5E-008	-	4.3E-005	5.1E-005	(Total)	1.1E-001	-	9.5E-001	1.1E+000	
Soil	Subsurface Soil	AOC 4 - ARC	Aroclor-1248	5.4E-008	-	8.3E-007	8.8E-007	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	2.0E-008	-	3.1E-007	3.3E-007	Aroclor-1254	Immune	1.4E-003	-	2.2E-002	2.3E-002
			Antimony	-	-	-	-	Antimony	Whole body/blood	2.6E-003	-	3.0E-003	5.6E-003
			Arsenic	3.5E-008	-	1.2E-005	1.6E-005	Arsenic	Skin	2.1E-002	-	7.4E-002	9.5E-002
			(Total)	3.6E-008	-	1.3E-005	1.7E-005	(Total)	2.5E-002	-	9.9E-002	1.2E-001	
			Building Materials	Building Materials	AOC 4 - ARC	Aroclor-1254	1.1E-005	-	1.7E-004	1.8E-004	Aroclor-1254	Immune	7.4E-001
2,3,7,8-TCDD equiv.	4.6E-004	-				1.5E-003	2.0E-003	2,3,7,8-TCDD equiv.	-	-	-	-	-
Antimony	-	-				-	-	Antimony	Whole body/blood	3.9E+001	-	4.5E+001	8.4E+001
Arsenic	6.9E-005	-				2.3E-004	3.0E-004	Arsenic	Skin	4.1E-001	-	1.4E+000	1.8E+000
(Total)	5.4E-004	-				1.9E-003	2.5E-003	(Total)	4.0E+001	-	5.8E+001	9.8E+001	
Total Risk Across[Media]						Total Hazard Index Across All Media and All Exposure Routes				1.0E+002			
Total Risk Across All Media and All Exposure Routes				2.8E-003									

Total [Skin] HI = 2.3E+000  
Total [Whole Body/blood] HI = 8.4E+001  
Total [Immune] HI = 1.4E+001

TABLE 10.3.CT  
RISK ASSESSMENT SUMMARY  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Site Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Building Materials	Building Materials	AOC 4 - ARC	Aroclor-1254	2.6E-007	—	7.4E-006	7.7E-006	Aroclor-1254	Immune	5.6E-002	—	1.4E+000	1.5E+000
			2,3,7,8-TCDD equiv.	1.1E-005	—	6.8E-005	7.9E-005	2,3,7,8-TCDD equiv.	—	—	—	—	—
			Antimony	—	—	—	—	Antimony	Whole body/blood	4.5E+000	—	8.1E+000	1.3E+001
			Arsenic	5.3E-006	—	3.3E-005	3.8E-005	Arsenic	Skin	1.0E-001	—	5.6E-001	6.6E-001
			(Total)	1.7E-005	—	1.1E-004	1.2E-004	(Total)	(Total)	4.7E+000	—	1.0E+001	1.5E+001

TABLE 10.4.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 1 - HRDD	Aroclor-1248	3.2E-007	—	5.9E-007	9.1E-007	Aroclor-1248	—	—	—	—	—
			Aroclor-1254	2.9E-008	—	5.2E-008	8.1E-008	Aroclor-1254	Immune	5.1E-002	—	9.5E-002	1.5E-001
			Aroclor-1260	2.4E-008	—	4.4E-008	6.8E-008	Aroclor-1260	—	—	—	—	—
			Arsenic	1.4E-006	—	5.2E-007	1.9E-006	Arsenic	Skin	2.1E-001	—	8.5E-002	3.0E-001
			(Total)	1.8E-006	—	1.2E-006	3.0E-006	(Total)		2.6E-001	—	1.8E-001	4.4E-001
Soil	Subsurface Soil	AOC 1 - HRDD	Aroclor-1248	4.4E-008	—	8.0E-008	1.2E-007	Aroclor-1248	—	—	—	—	—
			Aroclor-1254	3.3E-009	—	5.9E-009	9.2E-009	Aroclor-1254	Immune	5.8E-003	—	1.1E-002	1.7E-002
			Aroclor-1260	1.1E-007	—	1.9E-007	3.0E-007	Aroclor-1260	—	—	—	—	—
			Arsenic	6.2E-007	—	2.4E-007	8.6E-007	Arsenic	Skin	9.8E-002	—	3.9E-002	1.4E-001
			(Total)	7.8E-007	—	5.2E-007	1.3E-006	(Total)		1.0E-001	—	5.0E-002	1.5E-001
Soil	Test Pit Soil	AOC 1 - HRDD	Aroclor-1248	1.4E-006	—	2.5E-006	3.9E-006	Aroclor-1248	—	—	—	—	—
			Aroclor-1254	2.1E-007	—	3.8E-007	5.9E-007	Aroclor-1254	Immune	3.7E-001	—	6.9E-001	1.1E+000
			Antimony	—	—	—	—	Antimony	Whole body/blood	3.9E+000	—	5.2E-001	4.4E+000
			Arsenic	1.8E-005	—	7.0E-006	2.5E-005	Arsenic	Skin	2.8E+000	—	1.1E+000	3.9E+000
			(Total)	2.0E-005	—	1.0E-005	3.0E-005	(Total)		7.1E+000	—	2.3E+000	9.5E+000
Total Risk Across All Media and All Exposure Routes							3.4E-005	Total Hazard Index Across All Media and All Exposure Routes					1.0E+001

Total (Skin) HI = 4.3E+000  
Total (Immune) HI = 1.2E+000  
Total (Whole Body/Blood) HI = 4.4E+000

TABLE 10.4.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil	Surface Soil	AOC 2 - ADC	Benzo(a)anthracene	2.8E-007	-	4.4E-007	7.0E-007	Benzo(a)anthracene	-	-	-	-	-	
			Benzo(b)fluoranthene	3.7E-007	-	6.3E-007	1.0E-006	Benzo(b)fluoranthene	-	-	-	-	-	
			Benzo(a)pyrene	2.5E-006	-	4.2E-006	6.7E-006	Benzo(a)pyrene	-	-	-	-	-	
			Indeno(1,2,3-cd)pyrene	1.5E-007	-	2.5E-007	4.0E-007	Indeno(1,2,3-cd)pyrene	-	-	-	-	-	
			Dibenzo(a,h)anthracene	2.9E-007	-	4.8E-007	7.7E-007	Dibenzo(a,h)anthracene	-	-	-	-	-	
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	2.4E-001	-	4.4E-001	6.8E-001	
			Arsenic	4.1E-005	-	1.8E-008	4.1E-005	Arsenic	Skin	1.5E+001	-	5.8E+000	2.1E+001	
			(Total)	4.5E-005	-	6.0E-008	5.1E-005	(Total)		1.5E+001	-	6.2E+000	2.1E+001	
Soil	Subsurface Soil	AOC 2 - ADC	Benzo(b)fluoranthene	3.9E-008	-	6.6E-008	1.1E-007	Benzo(b)fluoranthene	-	-	-	-	-	
			Benzo(a)pyrene	5.8E-007	-	9.8E-007	1.6E-006	Benzo(a)pyrene	-	-	-	-	-	
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	1.8E-001	-	2.4E-001	4.2E-001	
			Arsenic	2.1E-005	-	8.2E-006	2.9E-005	Arsenic	Skin	3.3E+000	-	1.3E+000	4.6E+000	
			(Total)	2.2E-005	-	9.2E-006	3.1E-005	(Total)		3.5E+000	-	1.5E+000	5.0E+000	
Building Materials	Building Materials	AOC 2 - ADC	Benzo(a)anthracene	1.4E-005	-	2.3E-005	3.7E-005	Benzo(a)anthracene	-	-	-	-	-	
			Benzo(b)fluoranthene	1.7E-005	-	2.9E-005	4.6E-005	Benzo(b)fluoranthene	-	-	-	-	-	
			Benzo(a)pyrene	1.4E-004	-	2.3E-004	3.7E-004	Benzo(a)pyrene	-	-	-	-	-	
			Indeno(1,2,3-cd)pyrene	3.7E-006	-	6.3E-006	1.0E-005	Indeno(1,2,3-cd)pyrene	-	-	-	-	-	
			Dibenzo(a,h)anthracene	1.1E-005	-	1.9E-005	3.0E-005	Dibenzo(a,h)anthracene	-	-	-	-	-	
			Methoxychlor	-	-	-	-	Methoxychlor	Reproductive	3.6E-002	-	3.6E-003	4.0E-002	
			Arsenic	2.1E-006	-	8.3E-007	2.9E-006	Arsenic	Skin	3.4E-001	-	1.0E-002	3.5E-001	
			(Total)	1.9E-004	-	3.1E-004	5.0E-004	(Total)		3.8E-001	-	1.4E-002	3.9E-001	
			Total Risk Across [Media]				Total Hazard Index Across All Media and All Exposure Routes							
			Total Risk Across All Media and All Exposure Routes				5.8E-004				2.7E+001			

TABLE 10.4.CT  
RISK ASSESSMENT SUMMARY  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Building Materials	Building Materials	AOC 2 - ADC	Benzo(a)anthracene	5.8E-006	-	9.8E-006	1.6E-005						
			Benzo(b)fluoranthene	6.7E-006	-	1.1E-005	1.8E-005						
			Benzo(a)pyrene	5.3E-005	-	8.9E-005	1.4E-004						
			Indeno(1,2,3-cd)pyrene	1.8E-006	-	3.1E-005	3.3E-005						
			Dibenzo(a,h)anthracene	5.3E-006	-	8.9E-006	1.4E-005						
			Methoxychlor	-	-	-	-						
			Arsenic	1.2E-006	-	4.6E-007	1.7E-006						
			(Total)	7.4E-005	-	1.2E-004	2.0E-004						

TABLE 10.4.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Test Pit Soil	AOC 3 - SPD	Hexachloroethane	2.4E-006	-	3.1E-006	5.5E-006	Hexachloroethane	Kidney	1.2E+001	-	1.6E+001	2.8E+001
			Aroclor-1248	7.1E-007	-	1.30E-006	2.0E-006	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	2.0E-007	-	3.70E-007	5.7E-007	Aroclor-1254	Immune	3.6E-001	-	6.7E-001	1.0E+000
			(Total)	3.3E-006	-	4.8E-006	8.1E-006	(Total)		1.2E+001	-	1.7E+001	2.9E+001
			Total Risk Across All Media and All Exposure Routes				8.1E-006	Total Hazard Index Across All Media and All Exposure Routes					2.9E+001

Total [Kidney] HI = 2.8E+001  
Total [Immune] HI = 1.0E+000

TABLE 10.4.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	AOC 4 - ARC	Aroclor-1248	3.0E-008	-	5.5E-008	8.5E-008	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	6.8E-008	-	1.2E-007	1.9E-007	Aroclor-1254	Immune	1.2E-001	-	2.2E-001	3.4E-001
			Aroclor-1260	1.6E-008	-	2.9E-008	4.5E-008	Aroclor-1260	-	-	-	-	-
			Antimony	-	-	-	-	Antimony	Whole body/blood	5.4E-002	-	7.2E-003	6.1E-002
			Arsenic	8.9E-007	-	2.7E-007	9.8E-007	Arsenic	Skin	1.1E-001	-	4.3E-002	1.5E-001
			(Total)	8.0E-007	-	4.7E-007	1.3E-006	(Total)	2.8E-001	-	2.7E-001	5.5E-001	
Soil	Subsurface Soil	AOC 4 - ARC	Aroclor-1248	5.1E-009	-	9.2E-009	1.4E-008	Aroclor-1248	-	-	-	-	-
			Aroclor-1254	1.9E-009	-	3.4E-009	5.3E-009	Aroclor-1254	Immune	3.4E-003	-	6.3E-003	9.7E-003
			Antimony	-	-	-	-	Antimony	Whole body/blood	6.3E-003	-	8.4E-004	7.1E-003
			Arsenic	3.3E-007	-	1.3E-007	4.6E-007	Arsenic	Skin	5.2E-002	-	2.1E-002	7.3E-002
			(Total)	3.4E-007	-	1.4E-007	4.8E-007	(Total)	6.2E-002	-	2.8E-002	9.0E-002	
			Building Materials	Building Materials	AOC 4 - ARC	Aroclor-1254	1.0E-008	-	1.8E-008	2.8E-008	Aroclor-1254	Immune	1.8E+000
2,3,7,8-TCDD equiv.	4.3E-005	-				1.7E-005	6.0E-005	2,3,7,8-TCDD equiv.	-	-	-	-	-
Antimony	-	-				-	-	Antimony	Whole body/blood	9.5E+001	-	1.3E+001	1.1E+002
Arsenic	6.5E-008	-				2.5E-008	9.0E-008	Arsenic	Skin	1.0E+000	-	4.1E-001	1.4E+000
(Total)	5.1E-005	-				4.3E-006	7.2E-005	(Total)	9.8E+001	-	1.7E+001	1.1E+002	
Total Risk Across Media						Total Hazard Index Across All Media and All Exposure Routes				1.2E+002			
Total Risk Across All Media and All Exposure Routes							7.4E-005						

Total [Skin] HI = 1.8E+000  
Total [Whole Body/blood] HI = 1.1E+002  
Total [Immune] HI = 5.5E+000



TABLE 10.4.CT  
RISK ASSESSMENT SUMMARY  
CENTRAL TENDENCY EXPOSURE  
HORSESHOE ROAD COMPLEX SITE, SAYREVILLE, NEW JERSEY

Scenario Timeframe: Future  
Receptor Population: Construction Workers  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Building Materials	Building Materials	AOC 4 - ARC						Aroclor-1254	Immune	3.4E-001	-	6.3E-001	9.7E-001
								2,3,7,8-TCDD equiv.	-	-	-	-	-
								Antimony	Whole body/blood	2.7E+001	-	3.8E+000	3.1E+001
								Arsenic	Skin	6.2E-001	-	2.5E-001	8.7E-001
									(Total)	2.8E+001	-	4.5E+000	3.2E+001